Dissertation on

A PROSPECTIVE STUDY OF EYELID INJURIES

Submitted in partial fulfillment of requirements of

M.S. OPHTHALMOLOGY

BRANCH – III

REGIONAL INSTITUTE OF OPHTHALMOLOGY

MADRAS MEDICAL COLLEGE

CHENNAI – 600 003

THE TAMILNADU

DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI

APRIL 2013

CERTIFICATE

This is to certify that the dissertation titled, "A PROSPECTIVE STUDY OF EYELID INJURIES" submitted in partial fulfillment for the award of the degree of Master of Surgery in Ophthalmology by the Tamilnadu Dr.M.G.R.Medical university,Chennai is a bonafide record of the work done by Dr. AARTHY.R , Post graduate in M.S. (OPTHALMOLOGY), in Regional Institute Of Ophthalmology, Government Ophthalmic Hospital, Egmore Chennai, during the academic year 2011-2013, under our guidance.

PROF. DR.M.SUBASHINI M.S.,D.O.,
H.O.D OF ORBIT AND OCULOPLASTY,
Regional Institute of Ophthalmology,
Chennai – 8.

PROF. DR. K. MARAGATHAM. M.S., D.O.,
DIRECTOR AND SUPERINTENDENT I/C,
Regional Institute of Ophthalmology,
Madras Medical College,
Chennai – 8.

PROF. DR. V. KANAGASABAI. M.D., Ph.D.,
DEAN,
Madras Medical College &
Government General Hospital,
Chennai – 3.

ACKNOWLEDGEMENT

I express my sincere thanks to **Prof.Dr.KANAGASABAI M.D., Ph.D., Dean of Madras Medical College,** for having allowed me to do this study.

I express my heartfelt thanks to **Prof.Dr.K.MARAGATHAM M.S.,D.O., Director and Superintendent,** Regional Institute Of Ophthalmology, Government Ophthalmic Hospital, Madras Medical College, Chennai for allowing me to pursue this study and use the required clinical materials. I also express my sincere thanks to **Prof.Dr.VASANTHA M.S.,FRCS**, our former director.

I express my sincere thanks to **Prof.Dr.M.SUBASHINI M.S., D.O.,H.O.D. of Orbit and Oculoplasty** for her invaluable guidance and support during the conduct of this study.

I express my profound gratitude to **Dr.A.SAMARAPURI M.S**., for his incessant help and support during the course of this study.

I express my heartfelt thanks to **Dr.A.YOGESWARI,M.S.,** fo her help and support during conduct of this study. I express my sincere thanks to **Dr.P.ASHOK KUMAR M.S.,** for his guidance and support during this study.

I express my heartfelt thanks to all my professors and assistant professors for their help and guidance during this study.

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No : 04425305301
Fax : 04425363970

CERTIFICATE OF APPROVAL

To
Dr. Aarthy.R
PG in MS Ophthalmology
RIO & Govt. Ophthalmic Hospital, Egmore, Chennai -8

Dear Dr. Aarthy .R

The Institutional Ethics Committee of Madras Medical College reviewed and discussed your application for approval of the proposal entitled " A Prospective study of Eyelid injuries " No. 26092011

The following members of Ethics Committee were present in the meeting held on 27.09.2011 conducted at Madras Medical College, Chennai –3

1. Dr. S.K. Rajan MD	-- Chairperson
2. Dr. V. Kanagasabai MD Dean, Madras Medical College, Chennai -3	-- Deputy Chairman
3. Prof. R. Sundaram MD Vice Principal, Madras Medical College, Chennai -3	-- Member Secretary
4. Prof. R. Nandhini MD Director , Inst. of Pharmacology, MMC , Ch-3	-- Member
5. Prof. Pregna B. Dolia MD Director , Inst. of Biochemistry, M M C, Ch-3	-- Member
6. Thiru . Ulaganathan Administrative Officer, M M C, Ch-3	-- Layperson
7. Thiru. S. Govindasamy BA BL	-- Lawyer
8. Tmt. Arnold Saulina .MA., MSW	-- Social Scientist

We approve the Proposal to be conducted in its presented from

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study , any changes in the protocol and patient information / informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics committee

turnitin

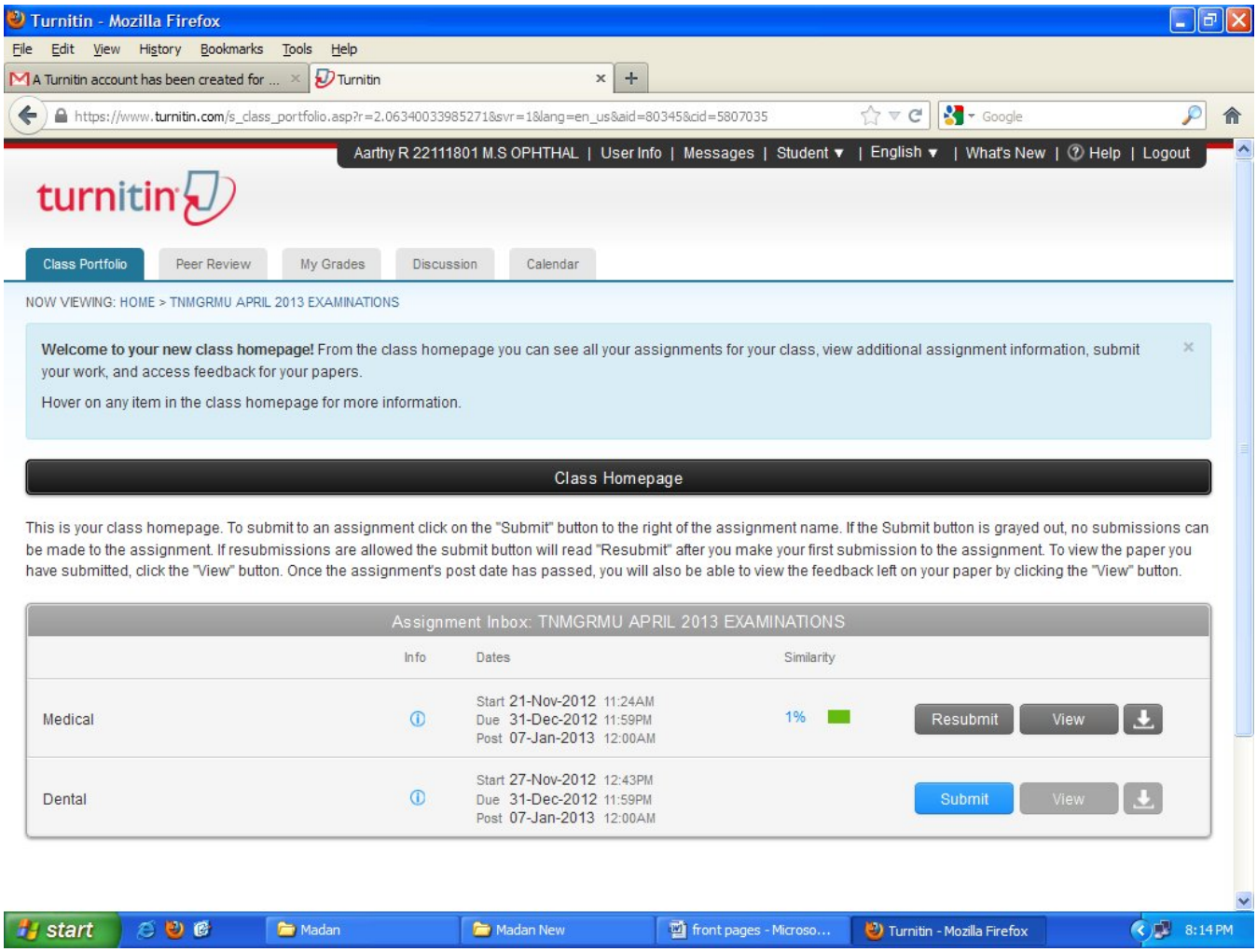
Your digital receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

Paper ID	292656083
Paper title	A PROSPECTIVE STUDY OF EYELID INJURIES
Assignment title	Medical
Author	Aarthy R 22111801 M.S OPHTHAL
E-mail	rajasekaraarthy261@gmail.com
Submission time	24-Dec-2012 07:28PM
Total words	15064

First 100 words of your submission

INTRODUCTION Eyelids play a very important role in maintaining the anatomic and functional integrity of eyeball. Eyelid injuries are common in the present world. Development of industrialization, faster modes of transportation and increase in acts of intentional assaults upon persons are responsible for increase in incidence of eyelid injuries. Eyelid injuries are often associated with vision threatening ocular injuries. Proper examination and management of eyelid injuries is important in preventing eyelid deformities like traumatic lid colomboma and lagophthalmos which can compromise ocular surface and thereby threaten vision. In cases in which they are part of polytrauma, treatment of the...


Turnitin - Mozilla Firefox
File Edit View History Bookmarks Tools Help
A Turnitin account has been created for ...
Turnitin
https://www.turnitin.com/s_class_portfolio.asp?r=2.06340033985271&svr=1&lang=en_us&aid=80345&cid=5807035
Google
Aarthy R 22111801 M.S OPHTHAL | User Info | Messages | Student ▼ | English ▼ | What's New | Help | Logout
turnitin
Class Portfolio
Peer Review
My Grades
Discussion
Calendar
NOW VIEWING: HOME > TNMGRMU APRIL 2013 EXAMINATIONS
Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers.
Hover on any item in the class homepage for more information.
Class Homepage
This is your class homepage. To submit to an assignment click on the "Submit" button to the right of the assignment name. If the Submit button is grayed out, no submissions can be made to the assignment. If resubmissions are allowed the submit button will read "Resubmit" after you make your first submission to the assignment. To view the paper you have submitted, click the "View" button. Once the assignment's post date has passed, you will also be able to view the feedback left on your paper by clicking the "View" button.
Assignment Inbox: TNMGRMU APRIL 2013 EXAMINATIONS
Info
Dates
Similarity
Medical
Start 21-Nov-2012 11:24AM
Due 31-Dec-2012 11:59PM
Post 07-Jan-2013 12:00AM
1%
Resubmit
View
Dental
Start 27-Nov-2012 12:43PM
Due 31-Dec-2012 11:59PM
Post 07-Jan-2013 12:00AM
Submit
View
start
Madan
Madan New
front pages - Microso...
Turnitin - Mozilla Firefox
8:14 PM


Turnitin Document Viewer - Mozilla Firefox
https://www.turnitin.com/dv?o=292656C83&u=1015069704&s=&student_user=1&lang=en_us
TNMGRMU APRIL 2013 EXAMINAT...
Medical - DUE 31-Dec-2012
What's New
Originality
GradeMark
PeerMark
A PROSPECTIVE STUDY OF EYELID
turnitin
1%
SIMILAR
--
OUT OF 0
INTRODUCTION
Eyelids play a very important role in maintaning the anatomic and functional integrity of eyeball.
Eyelid injuries are common in the present world. Development of industrialization, faster modes of transportation and increase in acts of intentional assaults upon persons are responsible for increase in incidence of eyelid injuries. Eyelid injuries are often associated with vision threatening ocular injuries. Proper examination and management of eyelid injuries is important in preventing eyelid deformities like traumatic lid colomboma and lagophthalmos which can compromise ocular surface and thereby threaten vision. In cases in which they are part of polytrauma, treatment of the life threatening injuries take precedent over management of eyelid injuries. Outcome of repair of eyelid injuries is not affected by delay of 72 hours, if better facilities are made for repair of eyelid injuries and local hygiene of the would is maintained. Meticulous repair of eyelid injuries is necessary in restoring normal structure and function of eyelids.
Match Overview
1 Chedly Bouzouaya. Publication <1%
2 Chedly Bouzouaya. Publication <1%
3 Reidy, J.P.. "Swelling... Publication <1%
4 Morley, A.M.S.. "Techn... Publication <1%
5 Ruth M Manners. Publication <1%
6 Roman Shinder. "Eyelid... Publication <1%
7 David R. Jordan. "Path... Publication <1%
8 Oscar Ramirez. Publication <1%
PAGE: 1 OF 152
Text-Only Report
start
GTA: Vice City
2 Window ...
3 Microsof...
AN_ANAI YT...
Turnitin - M...
Turnitin Doc. .
7:41 AM

DECLARATION OF THE CANDIDATE

I hereby declare that this dissertation titled “A PROSPECTIVE STUDY OF EYELID INJURIES”, is a genuine and bonafide research work done by me under the guidance of Prof.Dr.M.Subashini

Chennai, AARTHY.R

INDEX

PART-1

PART II

PART III

ABBREVATIONS

B Scan: Brightness scan

CT Scan: Computerized tomography scan

LPS: Levator palpebrae superioris

LCT: Lateral canthal tendon

MCT: Medial canthal tendon

MRI: Magnetic Resonance Imaging

INTRODUCTION

Eyelids play a very important role in maintaining the anatomic and functional integrity of eyeball.

Eyelid injuries are common in the present world. Development of industrialization, faster modes of transportation and increase in acts of intentional assaults upon persons are responsible for increase in incidence of eyelid injuries. Eyelid injuries are often associated with vision threatening ocular injuries. Proper examination and management of eyelid injuries is important in preventing eyelid deformities like traumatic lid colomboma and lagophthalmos which can compromise ocular surface and thereby threaten vision. In cases in which they are part of polytrauma, treatment of the life threatening injuries take precedent over management of eyelid injuries. Outcome of repair of eyelid injuries is not affected by delay of 72 hours, if better facilities are made for repair of eyelid injuries and local hygiene of the wound is maintained. Meticulous repair of eyelid injuries is necessary in restoring normal structure and function of eyelids.

ANATOMY OF EYELIDS

The upper eyelid extends downward from eyebrow to end in a free margin which forms the upper boundary of palpebral fissure. The lower eyelid merges into tissues of cheek. Each eyelid is divided by a horizontal furrow called palpebral sulcus into orbital and palpebral part.

The two eyelids meet each other at medial and lateral canthi.The lateral canthus is in close contact with globe. The medial canthus is rounded, has upper and lower lacrimal canaliculi. Medial canthus is situated 6mm medial to eyeball, separated from the eyeball by lacus lacrimalis, caruncula lacrimalis and pars lacrimalis.

EYELID MARGINS:

The margins are 2mm in width, 30 mm in length. Each lid margin is divided into two parts by lacrimal papillae into medial one sixth called the lacrimal portion and lateral five sixrh called the ciliary portion. Anterior border is rounded and posterior border is sharp, which is necessary for maintanence of tear film. Meibomian gland orifices are present in front of posterior margin of eyelids. The grey line marks the junction between skin and conjunctiva and divides the eyelid margin into anterior lamella consisting skin and Orbicularis muscle and posterior lamella consisting tarsus and conjunctiva[1]

EYELASHES:

Eyelashes are short curved hairs. They are arranged in 2-3 rows. In upperlid there are 150 lashes which are directed forward, and in lower lid there are 75 lashes directed forward, downward, backward. Glands of Zeiss and Moll open into hair follicle[1].

PALPEBRAL APERTURE:

It is the space bound by upper and lower eyelids. They are elliptical in shape. Horizontal and vertical dimensions are 21mm and 8mm respectively in children, 28mm and 11mm respectively in adults.

LAYERS OF EYELIDS:

From outside inward, they are

1. Skin 2. Subcutaneous areolar tissue 3. Striated muscle-protractors 4.Submuscular areolar tissue 5.Fibrous layer 6.Retractor muscles of eyelid and nonstriated muscle 7.Conjunctiva

SKIN:

Skin of eyelids is elastic and has fine texture, contributing to speed and ease of movements. At lid margin, epithelium gets modified from anterior to posterior, by losing keratinisation. Dermis has a thin layer of connective tissue, blood vessels and lymphatics and melanocytes.

SUBCUTANEOUS AREOLAR TISSUE:

Subcutaneous tissue of eyelids is peculiar in that it has no fat and so it is readily distended by blood and fluid.

STRIATED MUSCLE-PROTRACTORS:

This layer is formed by Orbicularis Oculi which is present in both upper and lower eyelids. It is supplied by facial nerve. It has orbital and palpebral parts. Palpebral part (inner fibres) is involved in involuntary eyelid movements like blinking, Orbital part (peripheral fibres) is involved in forceful eyelid closure.

ORBITAL PART: It arises from anterior part of medial palpebral ligament and adjacent bones -upper orbital margin medial to supraorbital notch, maxillary process of frontal bone, frontal process of maxilla, lower orbital margin medial to infraorbital foramen. Fibres sweep superiorly and inferiorly and meet to form lateral palpebral raphe. These fibres extend over zygoma and intermingle with eyebrows and cheek.

PALPEBRAL PART: It has pretarsal and preseptal parts.

PRETARSAL PART: It has superficial and deep parts. Deep part takes origin from lacrimal fascia and posterior lacrimal crest. Superficial part originates from medial palpebral ligament. Deep part encircles both canaliculi to facilitate tear drainage. Upper and lower fibres of pretarsal muscle fuse in lateral canthal area to form lateral canthal tendon that insets over tubercle of Whitnall.

PRESEPTAL PART: It has superficial and deep parts. Deep portion arises from fascia around lacrimal sac and posterior lacrimal crest. Superficial part arises from anterior part of medial palpebral ligament and passes superficial to orbital septum to form dorsal palpebral raphe overlying lateral orbital rim.

ORBITAL SEPTUM:

Orbital septum is a multilayered sheet of fibrous tissue. It arises from periosteum over superior and inferior orbital rims. It is posterior to medial palpebral ligament and lateral palpebral raphe. In upper eyelid, at about 2-5mm from superior tarsal border, it fuses with levator aponeurosis. In lower eyelid, orbital septum fuses with capsulopalpebral fascia below inferior tarsal border.

It acts as a barrier between orbit and eyelids limiting spread of infection and haemmorhage. Orbital fat lies posterior to orbital septum

and anterior to levator aponeurosis. Orbital fat is an important landmark in eyelid laceration repair[1].

RETRACTORS OF EYELIDS:

In upper eyelid it is levator palpebrae superioris with Mullers muscle. Retractors of lower lid includes inferior tarsal muscle and capsulopalpebral fascia.

LEVATOR PALPEBRAE SUPERIORIS (LPS):

It originates from apex of orbit, from periorbita of lesser wing of sphenoid, above annulus of Zinn. Muscular portion is 40 mm in length, aponeurosis is 15mm in length .From its origin it passes above the superior rectus, its axis being slightly nasal. LPS continues towards tarsus and it divides into anterior and posterior portions. Anterior portion attaches to septa between pretarsal orbicularis at level of upper tarsal border and to pretarsal skin forming superior lid crease. Posterior portion inserts into anterior surface of lower portion of tarsus and few fibres attach to superior conjunctival fornix. It occupies whole width of orbit and forms lateral and medial horns. Lateral horn is strong divides lacrimal gland into orbital and palpebral parts, It is attached to orbital tubercle. Medial horn is more delicate and it has loose attachment to posterior lacrimal crest.

SUPERIOR TRANVERSE LIGAMENT OF WHITNALL: is a thickened band of orbital fascia extending from trochlear pulley to capsule of orbital lobe of lacrimal gland. It is formed by condensation of elastic fibres of anterior sheath of LPS and reflected tendon of superior oblique. It transfers force from anteroposterior to superoinferior direction.

SMOOTH MUSCLES:

SUPERIOR TARSAL MUSCLE (MULLER'S MUSCLE):

Muller's muscle orginates at undersurface of levator aponeurosis. 12-14mm above tarsal border, it extends downward to insert into superior tarsal margin. Peripheral arterial arcade is present between muller's muscle and LPS.

CAPSULOPALPEBRAL FASCIA AND INFERIOR TARSAL MUSCLE:

Capsulopalpebral fascia orginates from terminal fibres of inferior rectus muscle. It encircles and fuses with inferior oblique. Anterior to inferior oblique, it forms Lockwood suspensory ligament. This ligament extends into inferior conjunctival fornix and inserts into inferior tarsal border. Inferior tarsal muscle is poorly developed and lies posterior to capsulopalpebral fascia[1].

TARSAL PLATES:

Tarsi are firm dense plates of connective tissue and they act as skeleton of eyelids. Vertical height is 15mm in upper lid and 5 in lower eyelid. Length is 29mm. Tarsal plates have firm attachment to periosteum medially and laterally. Medial end of tarsi are attached to anterior lacrimal crest by medial palpebral ligament. Lateral end of tarsal plates are attached to Zygomatic bone by lateral palpebral ligament. Meibomean glands are situated in tarsal plates in parallel rows and oriented vertically. There are 20-25 glands in each lid[1].

CONJUNCTIVA:

It forms innermost layer of lids, covered by nonkeratinised squamous epithelium. It contains goblet cells and accessory lacrimal glands. Conjunctiva covering upper tarsal plate is firmly adherent to it in its entire extent. Conjunctiva covering inferior tarsal plate is adherent to it only in its upper half.

CANTHAL TENDONS: These structures maintain the configuration of palpebral fissure along with tarsal plates.

MEDIAL CANTHAL TENDON (MCT): It originates from anterior and posterior lacrimal crests. Origin from anterior lacrimal crest is

strong and that from posterior lacrimal crest is delicate. Attachment to posterior lacrimal crest is important for maintaining apposition of eyelid to globe and tear film.

LATERAL CANTHAL TENDON (LCT): It is attached to lateral orbital tubercle, inner aspect of orbital rim and tarsal borders. LCT inserts 2mm higher than MCT in Caucasians.

LACRIMAL PUNCTA:

They are present at junction of ciliary and lacrimal portion of lid margin. They are present upon an elevation called lacrimal papillae. Upper punctum is 6mm lateral to and lower punctum is 6.5mm lateral to inner canthus..

LACRIMAL CANALICULI:

Upper and lower lacrimal canaliculi have two parts - vertical part (2 mm in length) and horizontal part (8 mm in length), at right angles to each other, with diameter of 0.5mm. Both canaliculi unite to form common canaliculus. Common Canaliculus opens into diverticulum of lacrimal sac called Sinus of Maier[2].

BLOOD SUPPLY:

ARTERIAL SUPPLY:

1. Lateral palpebral arteries branch of lacrimal artery.
2. Medial palpebral arteries branch of Ophthalmic artery.

Each medial palpebral artery divides into two branches and anastomoses with branches of lateral palpebral artery. At about 3mm from margin of eyelids, these arteries form marginal arterial arcade[1] Peripheral arterial arcade is present only in upper lid and is formed between LPS and muller's muscle

VENOUS DRAINAGE:

1. Pretarsal vein is superficial, it drains into angular vein medially. Laterally it drains into lacrimal and superficial temporal vein.
2. Post tarsal vein drains into ophthalmic vein and deeper branches of facial vein, pterygoid venous plexus and cavernous sinus.

Veins in eyelids are larger and more numerous than arteries.

LYMPHATIC DRAINAGE:

Superficial pretarsal plexus and deep post tarsal plexus are present. Lateral $2/3^{rd}$ of upper and lower lids drain into superficial parotid lymph nodes. Medial $1/3^{rd}$ of upper and lower lid drain into submandibular lymph nodes.

NERVE SUPPLY:

Sensory supply of upper eyelids is by supratrochlear, supraorbital ,infratrochlear, lacrimal branches of ophthalmic division of trigeminal nerve. Sensory supply of lower eyelid is by infratrochlear nerve at the medial angle and infraorbital nerve in lateral part[1].

MOTOR NERVE SUPPLY:

Levator palpebrae superioris is supplied by occulomotor nerve.

Orbicularis oculi is supplied by Facial nerve.

Muller's muscle is supplied by sympathetic nerves.

FUNCTIONS OF EYELIDS:

1. Protective in function: sensory function of cilia, reflex blinking, secretions of glands help to protect ocular surface.
2. Maintenance of integrity of tear film
3. Maintenance position of globe
4. Protects eye from excessive light[1].

REVIEW OF LITERATURE

EYELID INJURIES:

Eyelid injuries are broadly classified into mechanical and non-mechanical injuries.

MECHANICAL INJURIES: They are classified into

1. Contusions
2. Crush wounds
3. Perforating injuries

CONTUSIONS: They are due to shearing forces from blunt injuries that disrupt skin, muscle and canthal tendons[4]. Less subcutaneous tissue and lax structures lead to swelling in short time. Blood extravasating into subcutaneous tissue leads to formation of "black eye". Spread of blood is limited attachment of fascia to eyebrows, nasojugal and malar folds. In early stages contused wounds have purple colour, colour changes to greenish brown and then into yellow. They disappear in 2-3 weeks[3]. Extravasation of blood into palpebral tissue developing one or two days after injury is seen in base of skull fractures. Bilateral periorbital ecchymosis is seen in fractures of anterior cranial fossa

TREATMENT:. Injury to canthal tendons and canaliculi,should be looked for and integrity is restored by suturing. Suturing of skin and muscle is done after trimming irregular edges[4]. Lateral canthal ligament is sutured to periosteum over lateral orbital margin and medial canthal ligament is sutured to periosteum over posterior lacrimal crest. In simple contusions ice pack is used to reduce swelling. Anti-inflammatory drugs and antibiotics are used to prevent secondary infection.

CRUSH WOUNDS: They are caused by blunt forces striking bone, leading to stretching of soft tissues which may get torn. Sharply defined wound running along orbital margin is produced[4]

TREATMENT: Crush wounds have irregular margin and devitalized tissues. Excision of tissues is kept to minimum because eyelids are highly vascular. After trimming wound margins, wound is sutured. Patients are treated with antibiotics and anti-inflammatory drugs.

PERFORATING WOUNDS: These include

1. Abrasions
2. Cut injuries
3. Punctures
4. Lacerated wounds.

ABRASIONS: They are caused by sharp objects. They involve only epidermis and heal rapidly. They are treated by cleaning the wound and application of topical antibiotics[4].

CUT INJURIES: They are caused by injuries with sharp objects. They have regular borders. Due to orientation of Orbicularis cuts running horizontally gape little but vertical cuts that divide fibres of orbicularis gape widely and defect appears larger[4].

TREATMENT: Adequate cleaning of wound is done followed by suturing.

PUNCTURE OR STAB WOUNDS: They are caused by sharp pointed objects. They have high chance of associated injury to eyeball, trochlea, superior and medial wall of orbit.

TREATMENT: They are treated by wound exploration and suturing.

LACERATED WOUNDS: They may be caused by perforating or blunt injuries. They may be superficial or deep. Their margins may be regular or ragged.

TREATMENT: They are treated by wound exploration and suturing[4].

OTHER INJURIES:

PROJECTILE INJURIES: They result from blasts of crackers and missiles. They may present with extensive laceration, loss of tissue, associated injury to eyeball, intraocular foreign bodies.

TREATMENT: They are treated by wound exploration, debridement and suturing. Associated injuries to eyeball have to be managed appropriately. Intaocular and intraorbital foreign bodies have to ruled out.

BITE INJURIES AND ANIMAL SCRATCH INJURIES: These injuries may have devitalized tissue and more chance of getting infected. Dog bites can cause canalicular laceration and lid avulsions[4].

TREATMENT: Antirabies vaccine should be given both intramuscularly and subcutaneously around the wound. Repair of injury is done after three doses of antirabies vaccine. Till repair, adequate cleaning should be done and wound should be left open without occlusive dressing[4].

EVALUATION OF EYELID INJURIES:

Injury to eyelids is usually apart of more extensive head and neck injury. So, life threatening injuries have to be managed first. Injuries to upper lid are most often associated with intracranial injuries.

In such cases lid injuries are cleaned, antibiotic ointment and sterile dressing applied. Repair of eyelid injuries is undertaken after general condition of patient is stabilized.

HISTORY:

- History pertaining to time and nature of injury, amount of force involved, type of object that caused the injury are enquired. Possiblity of retained foreign body should be considered.
- History regarding loss of vision and decreased vision, diplopia which suggest associated ocular injury and orbital bone fractures is elicited.
- History of epistaxis, CSF rhinnorhea, nasal congestion may suggest associated fracture of cribriform plate and medial orbital wall fracture.
- History regarding systemic diseases and intake of systemic drugs should be elicited. History regarding tetanus vaccination should be noted[4].

PHYSICAL EXAMINATION:

Systemic examination including pulse rate, blood pressure, respiratory rate and signs of severe blood loss should be looked for. Central nervous system and nasal cavity should be examined . Orbital

margins should be palpated to assess the integrity of bones and to look for tenderness.

OCULAR EXAMINATION:

A complete ophthalmic examination should be performed in all patients with eyelid injuries. Visual acuity and intraocular pressure are recorded. Slit lamp examination, assessment of extra ocular muscles, neurosensory evaluation with special attention to pupillary reaction should be done. Infraorbital anaesthesia should be looked for. Fundus examination is performed after dilation of pupil to rule out macular oedema, choroidal ruptures.

SPECIAL INVESTIGATIONS:

Radiological investigations are very useful in evaluating eyelid trauma. X-ray in anteroposterior view is useful in assessing integrity of orbital margins. CT scan of orbit in thin slices of 3mm cuts in axial, coronal, saggital section is useful in assessing extent of fracture and associated intracranial injury. MRI is useful in assessment of soft tissue injury. B scan of globe is important in ruling out associated retinal detachments, scleral dehiscence, foreign bodies. Orbital B scan is used to evaluate injury to orbital soft tissues[4].

PHOTOGRAPHIC DOCUMENTATION:

External photographs of eyelid injuries is very important for medico legal purposes and surgical planning. They also help in planning for secondary surgical procedures. They are useful for explaining to the patients, the severity of their injury and any anatomic and functional abnormalities that may arise[4].

PRINCIPLES OF TREATMENT:

Following principles are followed during repair of any eyelid injuries

1. Outcome of eyelid repair is not affected by waiting for 48-72 hours, if this allows time for better facilities to be made available[5].
2. Attempt should be made to remove all the foreign bodies. Retained intraocular and intraorbital foreign bodies should be considered and ruled out in all cases.
3. Wound should not be extended excessively to explore.
4. Use of small caliber sutures is preferred.
5. Deep tissue wounds should be opposed first.
6. Layer by layer approximation of wound is the preferred technique using browline,lid crease, lash line, meibomean gland opening ,grey line as landmark. Presence of orbital fat is a sign that orbital septum has been violated and chances for associated deeper orbital injury.

Septum need not be sutured[4]. Presence of ptosis is an indication for levator exploration.

7. Eversion of wound edges should be done
8. Excision of tissues should be kept to minimum.
9. Major reconstruction is delayed unless there is corneal exposure[5].
10. Addition of tissues should be considered during primary repair only if there is corneal exposu

PRIMARY SURGICAL REPAIR:

STEPS FOLLOWED IN PRIMARY SURGICAL REPAIR:

1. Gentle cleaning of wound with copious saline irrigation and removal of FB should be done.
2. Little debridement of wound edges is to be done.
3. Depth of wound is assessed and appropriate repair is done.

TREATMENT OF ABRASIONS:

Suturing is not required. Area should be kept clean and dry to allow for reepithelialization. Antibiotic ointment can be applied[4].

TREATMENT OF SUPERFICIAL LACERATIONS:

They involve epidermis and dermis but not orbicularis oculi. Simple lacerations parallel to skin crease can be closed with skin tape alone Running or interrupted sutures with non absorbable material may be

required. Suturing of skin should be without tension to avoid skin necrosis. Skin sutures are removed after 5 days.

DEEP LACERATIONS: These lacerations involve orbicularis oculi and retractors

TREATMENT OF INJURY TO ORBICULARIS:

Orbicularis Oculi injury is closed with placement of 5-0 or 6-0 absorbable, horizontal interrupted surures

TREATMENT OF INJURY TO RETRACTORS:

1. Long acting 6-0 absorbable sutures is used to repair levator aponeurosis
2. If Levator aponeurosis is disinserted from tarsus, double armed long acting 5-0 absorbable sutures is used reattach aponeurosis to tarsus
3. Orbital septum is usually not sutured to avoid inadvertent attachment to levator, orbicularis and skin, which leads to lid retraction.

FULL THICKNESS LACERATION NOT INVOLVING EYELID MARGIN:

1. Layer by layer closure is preferred
2. Conjunctiva is to be sutured if gaping is more than 5mm . Conjunctiva is sutured with rapidly absorbing 6-0 chromic catgut sutures and knot placed on tarsal surface.

3. Tarsal plates are sutured with long acting 5-0, 6-0 chromic catgut or polyglactin sutures. Suture knots should be placed on anterior tarsal surface to avoid irritation[5]
4. Long acting 6-0 absorbable sutures is used to repair muscle.
5. Skin closed with nonabsorbable sutures.

FULL THICKNESS LACERATION INVOLVING LID MARGIN:

Straight tarsal edges are obtained by removal of necrotic tissue. Tarsal edges should be kept straight to prevent tarsal buckling. Proper alignment of tarsal plate is necessary to prevent lid notching. Tarsus and muscle are sutured with absorbable sutures in layers.

THREE SUTURE TECHNIQUE: This technique is used to approximate eyelid margins

- First skin suture placed through meibomian gland orifices to a depth of 2-3mm into tarsus , suture is to be triple tied and left long
- Second suture placed at level of lash line, suture is to be triple tied and left long
- Third suture is placed in between the two, suture is to be triple tied and left long[5]
- Three margin sutures are used to place traction on the lid.

- Tarsus is closed using long acting absorbable sutures (5-0 chromic or polyglactin sutures). Knots are tied on anterior tarsal surface. Proper alignment of tarsal plate is necessary to achieve good aesthetic results[4].
- A "far-far/near-near" vertical mattress sutures can be used to evert eyelid margin.
- Three margin sutures are to be incorporated in superior most skin suture to prevent corneal injury.
- Eyelid margin sutures are removed after 10-14 sutures[5].

CANALICULAR LACERATIONS:

Lacerations involving medial aspect of lids often disrupt the canaliculus and medial canthal tendon. To get good anatomic and functional outcome, canaliculi have to be sutured with stenting to maintain patency. After 48-72 hours, chances of fibrosis and infection make canalicular intubation difficult.

ESSENTIAL POINTS IN CANALICULAR REPAIR:

1. Two canalicular cut ends are approximated under direct visualization using operating microscope. To maintain patency, a stent is required. At present silicone tubes 0.025 inches outside diameter and 0.012 inches inside diameter are most effective stent. 4-0 prolene, 24G

venflon can be used as stents. Repair with bicanalicular intubation with nasolacrimal duct intubation using Crawford stents can be done[4].

2. Canalicular ends are identified by using operating microscope, by gentle probing, using irrigation with methylene blue or fluorescein. Pigtail probe can be used to prevent the need for manipulation of distal nasolacrimal duct. Closure of pericanalicular tissues should be under tension.lacerated ends are opposed to one another by slight compression. Silicone tube is removed after six months. Lower canaliculus drains 80% of lacrimal secretion and so intubation of lower canaliculus is important in preventing epiphora.

CANTHAL TENDON INJURIES:

Canthal tendon are very important in maintaining position and function of eyelids.In cases of MCT injuries, associated base of skull fracture and CSF rhinorrhea should be and ruled out before repair.

MEDIAL CANTHAL TENDON INJURIES: In cases of MCT injuries, associated fractures of of skull base and CSF rhinorrhea should be ruled. In avulsions, it can be directly sutured to periosteum posterior to lacrimal sac using nonabsorbable sutures. If there are multiple nasal bone fractures, trans nasal wiring or microplating is needed. Reconstruction of extensive medial canthal ligaments, requires

skin pedicle flaps from glabellar or midline forehead region. If MCT injuries cannot be dealt within 72 hours, it can be allowed to granulate. Full thickness skin grafts can done later as vascularised medial canthus takes up grafts well[4].

LATERAL CANTHAL TENDON INJURIES: If LCT is avulsed it can be sutured to periosteum and lateral strip procedure can be combined. if additional tissue is required it can be mobilized from surrounding temporal area. Reconstruction of lateral canthus requires internal fixation and good vascularity. Laterally based transposition flaps are used for larger lower eyelid defects involving lateral canthus. Anterior lamella is reconstructed with full thickness semicircular advancement flaps. Posterior fixation to Whitnalls tubercle is preferred. Post operatively, symblepheron formation is to be prevented by mucous membrane grafting or symblepheron ring[4].

INJURIES WITH TISSUE LOSS:

In cases of eyelid injuries, tissue loss appears larger than real, due to retraction of orbicularis.

EYELID RECONSTRUCTION:

Aim of eyelid reconstruction is

1. To protect the globe from injuries
2. To prevent exposure of cornea .
3. To restore anatomy, function of eyelids and cosmesis of face

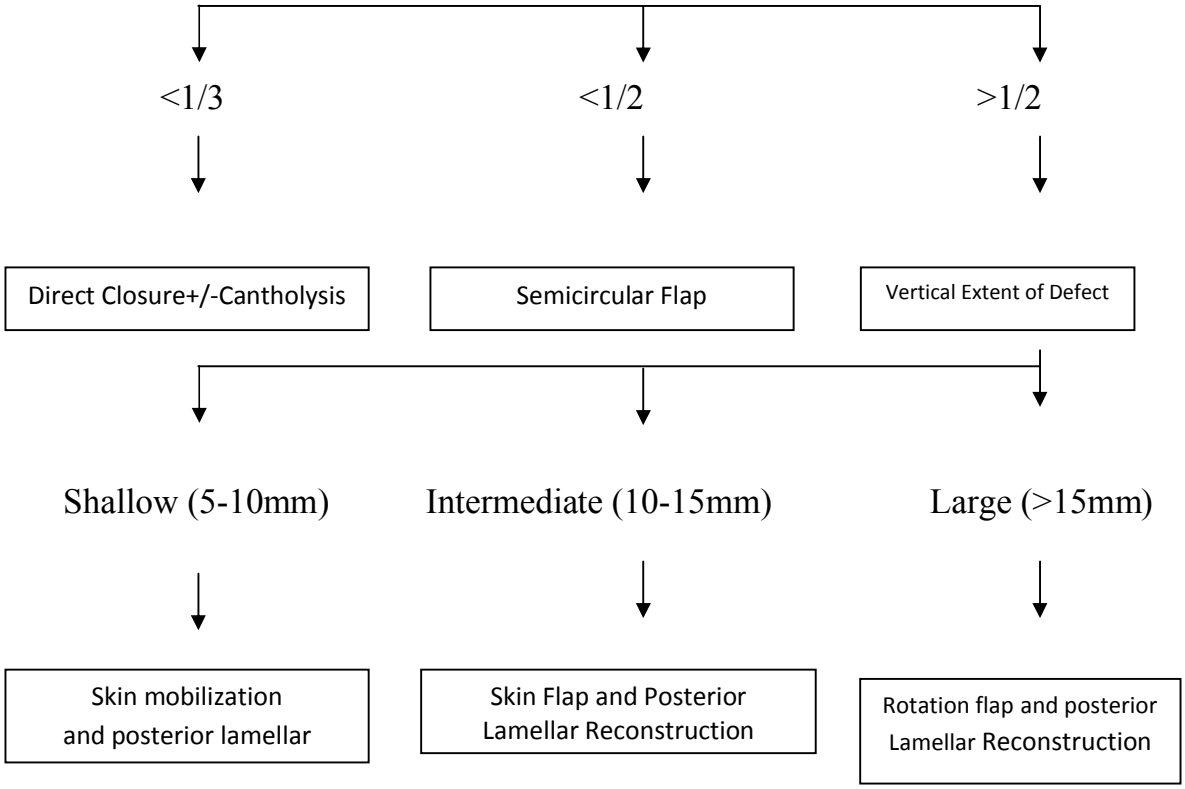
PRINCIPLES OF MANAGEMENT:

1. The lacerated lid with tissue loss is to be managed in same way as eyelids undergoing reconstruction after tumour removal
2. Both anterior and posterior lamella should be reconstructed[5]. Extent of the defect, blood supply, stability at medial and lateral canthi are determinants to method of reconstruction[4].
3. Grafts and flaps can be used. One lamella should have adequate blood supply and other lamella can be placed as a free graft.
4. Anterior lamella is to be reconstructed by mobilizing tissues as a myocutaneous flap, pedicle, or as skin graft.
5. Posterior lamella is reconstructed using free tarsal graft, or sliding tarsoconjunctival flap. Tarsal substitutes like nasal cartilage, sclera can be used.
6. Visual acuity and postoperative visual rehabilitation should be considered while deciding method of reconstruction[4].

7. Canthal tendon fixation must be done.
8. Defect should be made as narrow as possible
9. Availability of tissues for reconstruction and integrity of recipient bed should be assessed[4]

TECHNIQUE USED: Depends upon horizontal and vertical extent of wound defect. Extent is classified as less than 1/3rd, less than ½, more than ½.

Horizontal Extent of Defect



LOWER EYELID DEFECTS:

DIRECT CLOSURE: Indications are defects of size less than or equal to 1/4th in young patients and defects of 40% in older patients (due to lid laxity). Undermining of adjacent tissues is necessary. Lid margin should not be distorted. If tension distorts margin, skin graft or local skin flap is necessary. Advantage is maintenance of continuity of lash line Most important step is approximation of tarsal plates.

CANTHOTOMY AND CANTHOLYSIS:5-7mm canthotomy incision through skin and orbicularis in the lateral canthal angle is made to disinsert superior or inferior crus of lateral canthal tendon. Skin can be closed with absorbable sutures if necessary[4].

SKIN MOBILISATION AND POSTERIOR LAMELLAR RECONSTRUCTION: Best posterior lamella graft is tarsal plate harvested from upper lid or contralateral eyelid. Nasal septal cartilage with attached mucous membrane can be used as a graft. Adjacent skin is mobilized to cover the graft[4].

RECONSTRUCTION WITH FLAPS:

Flaps have their own blood supply. They provide match of skin texture and colour. Rectangular, rotational, transpositional and pedicle

flaps are used. Transpositinal flaps prevent development of tension when used to reconstruct anterior lamella. Careful planning is necessary to prevent secondary deformities of donor area. Medium defects can be closed by modification of Tenzel's semicircular flap. Large defects are closed by Hughes tarsoconjunctival flap, Mustarde's cheek rotation flap, tarsoconjunctival graft with skin flap[4].

TENZEL'S ROTATION FLAP: It is done for central or lateral defects involving 40%-50% of lid margin. High arched flap consisting of skin and orbicularis is cut. Orbital septum is seperated and conjunctiva is mobilized, lid is pulled medially and wound edges approximated. New lateral canthus is created[4].

HUGHES TARSOCONJUNCTIVAL FLAP: It is used to repair full thickness defects of lower lid involving margin. Tarsus and conjunctiva of upper lid is dissected and advanced as a flap into lower eyelid defect. Tarsoconjuctival flap is covered with mobilized skin or skin grafts. Conjunctival pedicle is divided after 3 weeks[5].

POSTERIOR LAMELLAR GRAFT AND SKIN FLAP: Posterior lamella is reconstructed with grafts. Pedicle skin flap is raised depending on the position of the defect. Nasojugal flap is used for medial lower eyelid defects, cheek flap is used for lateral lower eyelid defects. For defects in medial part of upper eyelid, midline frontal flaps

is used. For defects in lateral part of upper lid, flap is raised from forehead above eyebrow[5].

MUSTARDE'S CHEEK ROTATION FLAP: This is done to correct large vertical upper or lower lid defects. A large lower lid defect can be corrected with a cheek rotation flap. A large upper lid defect can be corrected by rotating the lower lid into the upper lid defect. Defect in lower lid is reconstituted with cheek rotation flap and posterior lamellar graft at a second stage[5].

UPPER EYELID DEFECTS:

1. Small defects are closed by direct closure with or without cantholysis.
2. Medium defects are corrected by Tenzel's semicircular flap.
3. Large defects are corrected by Cutler-Beard, tarsoconjunctival graft with skin flap.

CUTLER BEARD FLAP: Cutler beard is done for central intermediate defects of upper lid. A flap of lower lid tissue is mobilized 5mm below the margin and advanced under intact bridge of lower lid and sutured into upper eyelid defect.After the flap has stretched it is divided and lower lid reconstituted[5].

GLABELLAR FLAP: A V-Y flap is mobilized from glabellar region to cover defect in medial part of upper eyelid. It can be combined with lower lid bridge flap[5].

SPLIT LEVEL EYELID GRAFT: This is done in cases of vertical full thickness defects with normal lid margin. Shrinkage of lids following burns or irradiation lead to eyelid retraction, lagophthalmos. In these cases, post auricular skin is used to lengthen anterior lamella, and buccal mucous membrane is used to reconstruct posterior lamella.

SLIDING TARSAL FLAP: They are done in cases of defects which are very large to be repaired with advancement flaps and isolated medial or lateral defects of upper lid. Remaining layer of tarsoconjunctiva is slided horizontally to fill the defect and covered with skin muscle flap.

LOWER LID SWITCH FLAP: This is done in cases of broad shallow or marginal defects of upper lid .Pedicle is raised from lower lid and sutured to upper lid. 6mm length of lower lid can be used without compromising lower lid stability. It replaces lashes in margin and provides good cosmeis.

OTHERS:

COMPOSITE GRAFTING:Multiple composite grafts can be sutured together to repair large defects as one stage procedure[4].

EYELID MARGIN FREE GRAFT: Tarsoconjunctival and marginal eyelid grafts can be harvested from ipsilateral or contralateral eyelids. Autogenous tarsoconjunctival grafting is a developing technique that can be used to reconstruct full thickness defects. Composite hard palate free graft can be used. Hard palate grafting is very useful in cases with vertical tension like lower lid retraction. This is done to replace the lid margin with normal tissue. Maximum length of donor lid that can be used is 8mm.

LAISSEZ-FAIRE:

It is usually done for defects in medial canthal region, Defect is reduced to minimum by direct skin closure. Common limb of lateral canthal tendon is cut. Remanants of upper and lower lid are pulled medially and sutured to tissues found posterior to medial orbital wall. Post operatively, wound is kept clean and allowed to granulate. Scar formation leading to eyelid malposition can occur. This is corrected by skin grafting[5].

BITE WOUNDS:

1. They may be human or animal bites.
2. They may cause extensive lacerations. Dog bites cause avulsion of medial part of lids including the canaliculus. Injuries caused by horn of animals cause fracture of orbital walls and injuries to globe along with lid injuries.
3. Patients have to be given antirabies vaccine. Antirabies vaccine can be infiltrated subcutaneously around the wound in case of animal bites.
4. Wound suturing is done after required dose of antirabies vaccine. In cases of extensive laceration, primary stay suture of wound margins is applied .After immunization delayed primary or secondary surgical closure can be done[4].

NON-MECHANICAL INJURIES

NON-MECHANICAL INJURIES: They are

1. Chemical injuries
2. Thermal injuries
3. Radiation injuries

CHEMICAL INJURIES:

1. They are most common of nonmechanical injuries. They cause more damage to conjunctiva. Associated injury to ocular surface exists.
2. Extent of damage depends on nature of chemical, concentration of substance, duration of contact. Acids coagulate proteins so their penetration is less, alkalis cause more extensive damage as they penetrate deeper
3. Signs of chemical injury are eyelid oedema, excoriation of skin of eyelids, necrosis of tissues of eyelids, hyperemia of conjunctiva, limbal ischemia, corneal epithelial defects, anterior chamber reaction, necrotic retinopathy and globe rupture in severe cases.
4. Cicatrisation of eyelids develop leading to cicatricial ectropion, cicatricial entropion, symblepheron formation. Patients may develop exposure keratitis, dry eye as a result of these deformities[4].

TREATMENT:

1. Copious irrigation with saline.
2. Examination of upper fornix to look for impregnated chemical remanants.
3. Antibiotic steroid drops, lubricant eyedrops, antibioticsteroid ointment to conjunctiva, silver sulfadiazine ointment to skin. Rodding of conjunctival fornices to prevent symblepheron formation is done
4. Topical drugs are continued till the wound heals and any resulting eyelid abnormality is corrected by secondary surgical procedures. Mucous membrane grafting is necessary to reconstruct the fornix. Full thickness skin grafting is necessary to reconstruct anterior lamella.skin grafting or Z plasty is necessary to treat cicatricial ectropion and contracture.

THERMAL INJURIES:

Eyelids are involved in thermal burns of head and neck region. Eyelids may present with varying degree of burns. Mild thermal burns cause coagulation of proteins. In severe cases, and prolonged contact with high temperature, the lids are totally charred and eyeball is damaged.

CLASSIFICATION OF THERMAL INJURIES:

	First degree burns	Second degree burns/Partial thickness burns	Third degree burns
Causes	Match stick striing eyelid skin, mild sunburn	contact with hot metal or boiling water	Direct contact with flame, chemical ,electricity
Pathology/ layer involved	only epidermis	Epidermis and superficial layers of dermis	Epidermis and full thickness of dermis
Clinical features	Erythema	Blisters, erythema, exudation	Dry, hard, inelastic and painless. Swelling is absent.

TREATMENT:

1. Preventing contamination of involved area is the primary concern.
2. Gentle cleaning should be done.
3. Occlusive dressings and topical steroids should not used.

FIRST DEGREE BURNS:

1. Adequate cleaning of wound and application of antibiotic ointment over skin of eyelids.
2. Lubricant eyedrops and antibiotic ointment are used.
3. Skin begins to heal after three days after which cicatrisation may occur.

SECOND AND THIRD DEGREE BURNS:

1. Lubricating drops and antibiotic drops should be used frequently.
2. If corneal exposure is present, because of extensive tissue damage, immediate steps are to be taken to prevent corneal damage. Lubricant eyedrops should be used frequently. Temporary tarsorrhaphy may be necessary or frost sutures can be used.
3. Skin begins to heal after three days after which cicatrisation may occur leading to rapid detoriation of ocular status. Aggressive treatment is necessary to prevent irreversible damage. Permanent tarsorrhaphy can be done.
4. Relaxing incision through scars and excision of scar tissue is done.
5. Split or full thickness skin grafting can be done. Recipient lid needs to be stretched by use of tissue expanders. Burns involving canaliculi need intubation to prevent occlusion of canaliculi[4].

ELECTRICAL INJURIES:

1. Superficial burns present with swelling of lids and chemosis of conjunctiva, singing of eyelashes.
2. Deep burns cause full thickness perforation of eyelids
3. Lubricant eyedrops, antibiotic eye ointment are used.

4. Full thickness perforations need surgical closure after debridement of necrotic edges
5. Lagophtholmas may result from scarring which needs excision of scar tissue and skin grafting.

RADIATION BURNS:

1. They occur following radiotherapy to head and neck region,or accidental exposure
2. Erythema of lids occur in acute cases.
3. In chronic cases tissues of eyelids go for atrophy and necrosis.
4. Tarsus is very resistant to radiation, in chronic cases it may undergo fibrosis
5. Basal cell and squamous cell carcinoma can develop after many years in the area exposed to radiation

TREATMENT:

1. Topical antibiotics, lubricant eye drops are used.
2. Resulting eyelid abnormalities are corrected by surgery.
3. Flap is preferred to graft in correction of eyelid abnormalities due to radiation because blood supply is usually affected in radiation injuries.

COMPLICATIONS OF EYELID INJURIES

NOTCHING OF EYELID MARGINS:

1. This occurs due to improper alignment or due to vertical debridement of tarsal plate. Buckling of tarsal plate can lead to this defect.
2. This may lead to corneal exposure and keratinisation of conjunctiva,
3. Treatment is by resection of tarsal irregularity, extending from lid margin to antimarginal border of tarsus. Defect is excised in a pentagonal fashion, and tensionless suturing is done layer by layer[4].

PTOSIS:

1. Immediately following injury ptosis may occur due to haematoma or oedema of eyelids, it may also be due to third nerve injury, or injury to levator aponeurosis. Oedema and haematoma should be treated by anti inflammatory drugs, and cold compress.
2. Horizantal lacerations involving levator muscle or aponeurosis , if not repaired during primary suturing can result in ptosis. Traumatic ptosis can develop in cases of retractor injuries due to direct injury or stretching of aponeurosis, direct injury to muscle, injury to third nerve, lowering of fulcrum, mechanical restriction such as symblepheron.

These cases of ptosis should be observed for 6 months and explored by anterior (through skin) approach. Surgical corrections include 1.Aponeurotic advancement 2.Excision of scar tissue in Levator complex and use of spacers 3.Dermis fat graft used to form upperlid sulcus 4. Frontalis sling surgery[4].

3. Good levator function and high lid crease indicates injury to aponeurosis. This is corrected by external levator plication and reattachment of disinserted levator.
4. If ptosis is due to third nerve injury, ptosis repair is done after a period of three months. If LPS function is less than 4mm, sling surgeries should be done, if LPS action is more than 5mm external levator resection should be done.
5. Ptosis correction should be done after orbital fracture correction and extraocular muscle surgery.
6. In children with post traumatic ptosis, temporary frontalis sling is done to prevent development of amblyopia[4]..

UNSIGHTLY SCARS:

1. Scar formation usually occurs following repair of infected injuries, secondary suturing, in injuries with tissue loss.
2. Secondary repair delayed for six months, during which patient is advised to massage scar. Steroid ointment can be used if necessary. Subcutaneous injection of steroid into scar can be tried.
3. Correction of skin tension lines by fusiform excision, elliptical excision, pentagon excision, Z plasty. Free skin grafts harvested from postauricular, preauricular, other eyelids, supraclavicular region are used to correct tissue losses. Pedicle flaps can be used[4].

RETRACTION OF LIDS:

1. Scars involving orbital septum, Levator muscle, lower lid retractors cause retraction of eyelids.
2. Treatment is by excision of adhesion to orbital septum. Spacers like sclera or fascia lata can be used.
3. Treatment can be delayed for sixth months, during which massage of area can be tried. Repair can be done early, if corneal exposure develops[4].

EXTRAOCULAR MOTILITY DEFECTS:

1. Lacerations of lowerlid involving inferior rectus muscle may cause disinsertion of inferior rectus muscle. This should be managed by primary repair.
2. Vertical muscle imbalance develops late due to development of adhesions between Inferior rectus and eyelid tissue. This is to be treated by definite surgical procedure after a period of 3 months. Treatment includes lysis of adhesion bands.

INFECTIONS:

1. Eyelid injuries usually heal well because of good vascularity.
2. Adequate cleaning of wound at time of presentation is necessary to prevent infection.
3. Excessive debridment of wound is usually not required, but necrosed tissues in wound has to be excised.
4. During secondary surgical repair, retained foreign bodies have to be removed, existing fistulas have to be surgically excised[4].

COSMETIC DEFORMITY:

1. Any resulting eyelid abnormality like ectropion, entropion has to be corrected by definite surgical procedures after any necessary orbital or extra ocular muscle surgery.
2. Cicatricial ectropion is corrected by Z-plasty and skin grafting.
3. Cicatricial entropion is corrected by tarsal fracture, posterior lamella grafting and retractor repositioning.
4. Injury to medial canthal tendon leads to narrowing of palpebral fissure.

EPIPHORA:

1. Epiphora develops as a result of occlusion of canaliculi following canalicular injury,
2. It is corrected by conjunctivodacryocystorhinostomy .
3. Membranous adhesions and obstructions inside canaliculi are diagnosed by radiological investigations and lysed by LASER.

AIM OF STUDY

To study the causes, epidemiological aspects, clinical presentation, management and complications of eyelid injuries.

OBJECTIVES:

1. To assess the outcome of primary surgical repair to correct eyelid injuries
2. To study eyelid abnormalities resulting from injuries and their management
3. To study the secondary surgical procedures done to correct the resulting eyelid abnormalities.

MATERIALS AND METHODS:

This study was conducted in Regional Institute of Ophthalmology Chennai, from June 2011-June 2012. Patients presenting with eyelid lacerations needing surgical repair were included in the study. Patients were followed for six months with follow up visits at one week, one month, three months and six months.

INCLUSION CRITERIA:

1. Penetrating eyelid injuries.
2. Eyelid lacerations caused by blunt injuries.
3. Bite injuries.
4. Blast injuries.
5. Chemical Injuries.
6. Thermal injuries.

EXCLUSION CRITERIA:

1. Blunt Injuries without eyelid laceration.
2. Patients with preexisting eyelid deformity.

EVALUATION:

HISTORY:

Detailed history regarding mode and time of injury was obtained. Nature of injury, amount and direction of force involved, nature of object that caused the injury were noted.

History regarding any disturbance of vision like decreased visual acuity and diplopia was noted. History suggestive of injury to globe like decreased vision, pain, photophobia, was elicited. History suggestive of associated cranial injuries like, CSF rhinorrhea, bleeding from nostrils, loss of consciousness, seizures was elicited.

EXAMINATION OF EYELID INJURIES:

SYSTEMIC EXAMINATION:

Patients were examined to rule out systemic injuries. Systemic examination including pulse rate, blood pressure, respiratory rate, signs of blood loss were noted. Central nervous system and ENT examinations were done.

TORCH LIGHT EXAMINATION:

The eyelids were examined using torchlight with special attention to

1. Extent of injury,- horizontal and vertical extent, depth of wound (layers of eyelid involved)
2. Nature of wound and margins –clean wound, contaminated wound, infected wound, presence of necrosed tissues
3. Presence of foreign bodies
4. Injuries to eyeball-conjunctival tear, corneal epithelial defect and corneal tear, sclera tear, pupillary reaction and extraocular muscle action.

Visual acuity was recorded. Colour vision examination and field examination were done. Intraocular pressure was recorded using applanation tonometer or non contact tonometer depending on the condition of the patient.

SLIT LAMP EXAMINATION:

Slit lamp examination was done to make out 1) edges of eyelid laceration and presence of foreign bodies 2) depth of eyelid wound 3) extent of conjunctival lacerations 4) corneal epithelial defects using fluroscein staining 5) anterior chamber flare and cells 6) lens 7) spinchter tear in iris ,iridodialysis 8) pupillary reaction 9) vitreous

hemorrhage and also examination of fundus using 90D and 78D lens was done to rule out macular oedema.

EXAMINATION WITH OPHTHALMOSCOPE:

Direct ophthalmoscope was used to examine disc and macula, Indirect ophthalmoscope was used was used to look for choroidal rupture, retinal detachment.

PALPATION:

Orbital margins were palpated to make out irregularity, tenderness. Periorbital region was palpated to look for crepitus, due to fracture of bones of surrounding nasal sinuses.

NEUROSENSORY EXAMINATION:

Third nerve was examined by testing adduction, elevation and depression in abduction, pupillary reaction (direct and indirect light reflex). Fourth nerve was examined by testing depression in adduction and intorsion. Sixth nerve was examined by testing abduction. Fifth nerve was examined by testing corneal sensation and infraorbital sensation. Diplopia charting was done in cases with features suggestive of nerve injuries and in cases complaining of diplopia.

NASAL EXAMINATION:

Epistaxis, bony deviations were looked for using torch light. Cerebrospinal fluid rhinorrhea was looked for in cases with features suggestive injury to anterior cranial fossa..

RADIOLOGICAL INVESTIGATIONS:

X-ray orbit in anteroposterior view was taken to look for fracture of orbital walls, foreign bodies. CT scan of orbit in coronal and axial views was taken if required. B scan was done in patient with opaque media to look for, retinal dethachment intraocular foreign bodies. Orbital B scan was done to look for retrobulbar haemorrhage and orbital foreign bodies.

TREATMENT:

1. Tetanus toxoid was given to all patients.
2. Patients with minor injuries were treated as outpatients. All patient with injuries like avulsion of canthal tendons, canalicular laceration, injuries with tissue loss, infected wounds, and patients with associated ocular injuries were hospitalized.
3. All patients were treated with systemic and topical antibiotics to prevent infection. Anti inflammatory drugs were used to reduce swelling and pain. Second and third generation Fluoroquinolones and

Cephalosporins were used in oral and parenteral form. Fluoroquinolones, combination of antibiotics and steroids, lubricants, nonsteroidal anti-inflammatory drugs were used in topical form either as drops or ointment.

ANAESTHESIA:

Repair of eyelid injuries was done under local anaesthesis in all adults. 2% lignocaine with adrenaline was injected subcutaneously. Suturing was done under under general anaesthesia in children.

SURGICAL PROCEDURES:

1. Wound was cleaned with normal saline and 5% Iodine solution.
2. Wound exploration was done.
3. Bleeding was controlled by applying pressure and catching bleeders with forceps.
4. Minimum debridement of wound edges was done. Necrotic tissues were removed. Foreign bodies present in the wound were removed

ABRASIONS:

They were treated by cleaning and application of by topical antibiotic. Patients were instructed to keep the area clean and dry.

SIMPLE SKIN LACERATIONS:

In these cases, interrupted sutures with 6-0 non absorbable sutures (silk) were used to approximate wound edges in a tension free manner.

DEEP LACERATIONS – LACERATIONS INVOLVING MUSCLE AND SKIN:

Orbicularis oculi was approximated using 5-0 long acting absorbable catgut using horizontal interrupted sutures. Right angled edges and identifiable land marks were sutured first.

LACERATIONS INVOLVING LEVATOR COMPLEX, ORBICULARIS AND SKIN:

Levator muscle and aponeurosis were explored by extending the wound along line of lid crease. Patients were asked to look up and down during the procedure. Laceration of LPS complex ere sutured at time of primary repair. Edges of aponeurosis were approximated using 6-0 long acting absorbable sutures (catgut), edges of muscle were approximated using interrupted sutures with 5-0 long acting absorbable sutures (catgut). If aponeurosis was disinsertred, it was reattached to tarsus using double armed 4-0 long acting absorbable sutures (catgut). Care was taken to avoid incorporation of orbital septum in the wound.

FULL THICKNESS LACERTION NOT INVOLVING LID MARGIN:

Conjunctiva was approximated using absorbable suture (6-0 catgut), Tarsal plate was approximated using long acting absorbable suture (5-0 catgut) and muscle was sutured with absorbable suture (6-0 catgut). Knots were buried to avoid injury to cornea. Skin was closed with 6-0 silk.

FULL THICKNESS LACERATION INVOLVING EYELID MARGIN:

Conjunctiva was not sutured if gaping was less than 5mm. It was approximated using absorbable suture 6-0 catgut. Tarsal plate was approximated using long acting absorbable suture 5-0 catgut. Muscle was sutured with absorbable suture 6-0 catgut sutures and skin was closed with non absorbable sutures 6-0 silk. Eyelid margin were approximated using three suture technique.

LACERATIONS INVOLVING MEDIAL CANTHAL LIGAMENT:

Cut edges of injured limb of the ligament was sutured to periosteum over corresponding lacrimal crest using long acting absorbable suture (5-0 chromic catgut).

LACERATIONS INVOLVING LATERAL CANTHAL LIGAMENT:

Cut ends were sutured to periosteum over lateral orbital rim using long acting 5-0 chromic catgut sutures. New lateral canthus was formed.

CANALICULAR LACERATIONS:

Wounds were managed like full thickness lacerations involving lid margin. Canaliculi were repaired by approximating cut ends using cut edges of 24G venflon as a stent.

POST OPERATIVE MEDICAL TREATMENT:

Intravenous antibiotics were used in cases with extensive lacerations involving canaliculi, tissue loss, lid avulsions, contaminated wounds and in patients with wound infection. Oral antibiotics were used in cases with simple lacerations. Anti inflammatory drugs were used to control swelling and pain. Topical antibiotics (eye drops, eye ointments), lubricating eye drops were used. Antibiotic steroid drops were used in cases of chemical injury.

POST OPERATIVE FOLLOW UP:

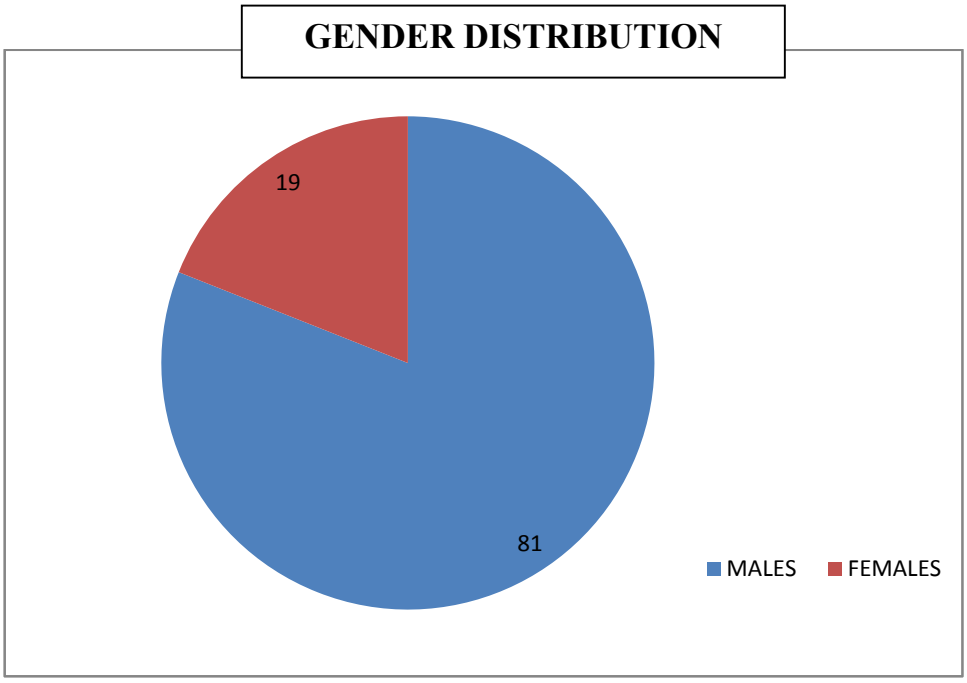
Patients were examined everyday for first three days. Post operative follow up examinations were at one week, one month, three months and were reviewed at six months if necessary. Skin sutures were removed after seven days, sutures in lid margin were removed after 14 days. Canalicular stents were removed after three months.

OBSERVATIONS

GENDER DISTRIBUTION:

In our study, eyelid injuries were found in 81 males and 19 female patients. Male to female ratio was 4.26:1.

GENDER	NUMBER OF PATIENTS
MALE	81
FEMALE	19

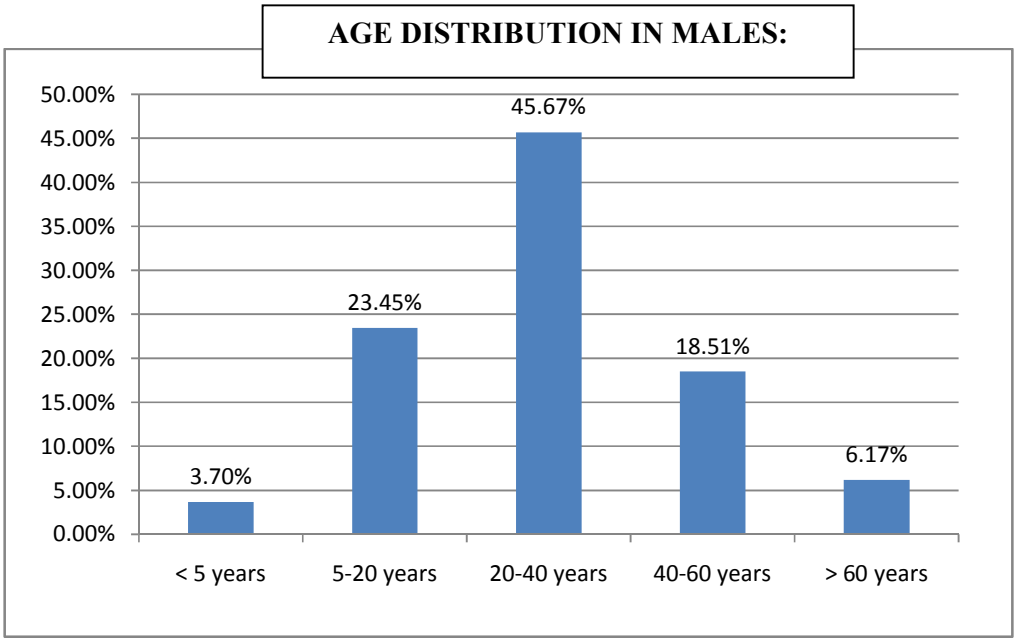


AGE DISTRIBUTION

AGE DISTRIBUTION IN MALES:

Among male patients, eyelid injuries were most commonly found in age group of 20-40 years,37 out of 81 patients were in age group.

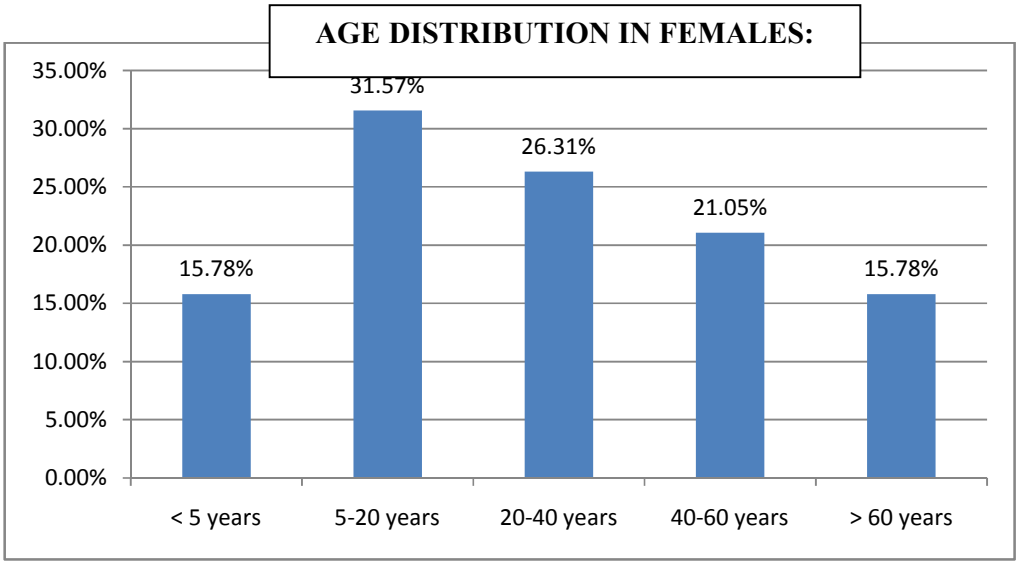
AGE GROUPS	NUMBER OF CASES	PERCENTAGE
<5 years	3	3.7%
5-20years	19	23.45%
20-40 years	37	45.67%
40-60 years	17	18.51%
>60 years	5	6.17%



AGE DISTRIBUTION IN FEMALES:

Among female patients, eyelid injuries were common in 5-20 age group,6 out of 19 patients were in this age group.

AGE GROUP	NUMBER OF CASES	PERCENTAGE
< 5years	2	15.78%
5-20 years	6	31.57%
20-40 years	5	26.31%
40-60 years	4	21.05%
> 60 years	2	15.78%



MODE OF INJURY

Modes of injury were analysed with respect to each age group

MODE OF INJURY IN PATIENTS LESS THAN 5 YEARS:

MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
ACCIDENTAL INJURIES	2	40%
ASSAULT	-	-
ROAD TRAFFIC ACCIDENTS	-	-
WORK PLACE INJURIES	-	-
PLAY RELATED INJURIES	2	40%
ANIMAL RELATED INJURIES	1	20%
THERMAL INJURIES	-	-
CHEMICAL INJURIES	-	-
TOTAL	5	

In patients less than 5 years, accidental and play related injuries were the most common causes.

MODE OF INJURY IN PATIENTS BETWEEN 5-20 YEARS OF AGE:

MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
ACCIDENTAL INJURIES	9	36%
ASSAULT	3	12%
ROAD TRAFFIC ACCIDENTS	5	20%
WORK PLACE INJURIES	1	4%
PLAY RELATED	5	12%
ANIMAL RELATED INJURIES	1	4%
BLAST INJURIES	1	4%
THERMAL INJURIES	-	-
CHEMICAL INJURIES	-	-
TOTAL	25	

In the age group of 5-20 years, accidental injury was the most common cause.

MODE OF INJURY IN PATIENTS 20-40 YEARS:

MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
ACCIDENTAL INJURIES	3	7.14%
ASSAULT	16	38.09%
ROAD TRAFFIC ACCIDENTS	12	28.57%
WORK PLACE INJURIES	6	14.28%
PLAY RELATED INJURIES	-	-
ANIMAL RELATED INJURIES	2	4.76%
BLAST INJURIES	1	2.38%
THERMAL INJURIES	2	4.76%
CHEMICAL INJURIES		
TOTAL	42	

In the age group of 20-40 years, assault was the most common cause of injury followed by road traffic accidents.

MODE IF INJURY IN 40-60 YEARS:

MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
ACCIDENTAL INJURIES	4	19.04%
ASSAULT	8	38.09%
ROAD TRAFFIC ACCIDENTS	4	19.04%
WORK PLACE INJURIES	3	14.28%
PLAY RELATED ACTIVITIES	-	-
ANIMAL RELATED INJURIES	1	4.76%
BLAST INJURIES	-	-
THERMAL INJURIES	-	-
CHEMICAL INJURIES	1	4.76%
TOTAL	21	

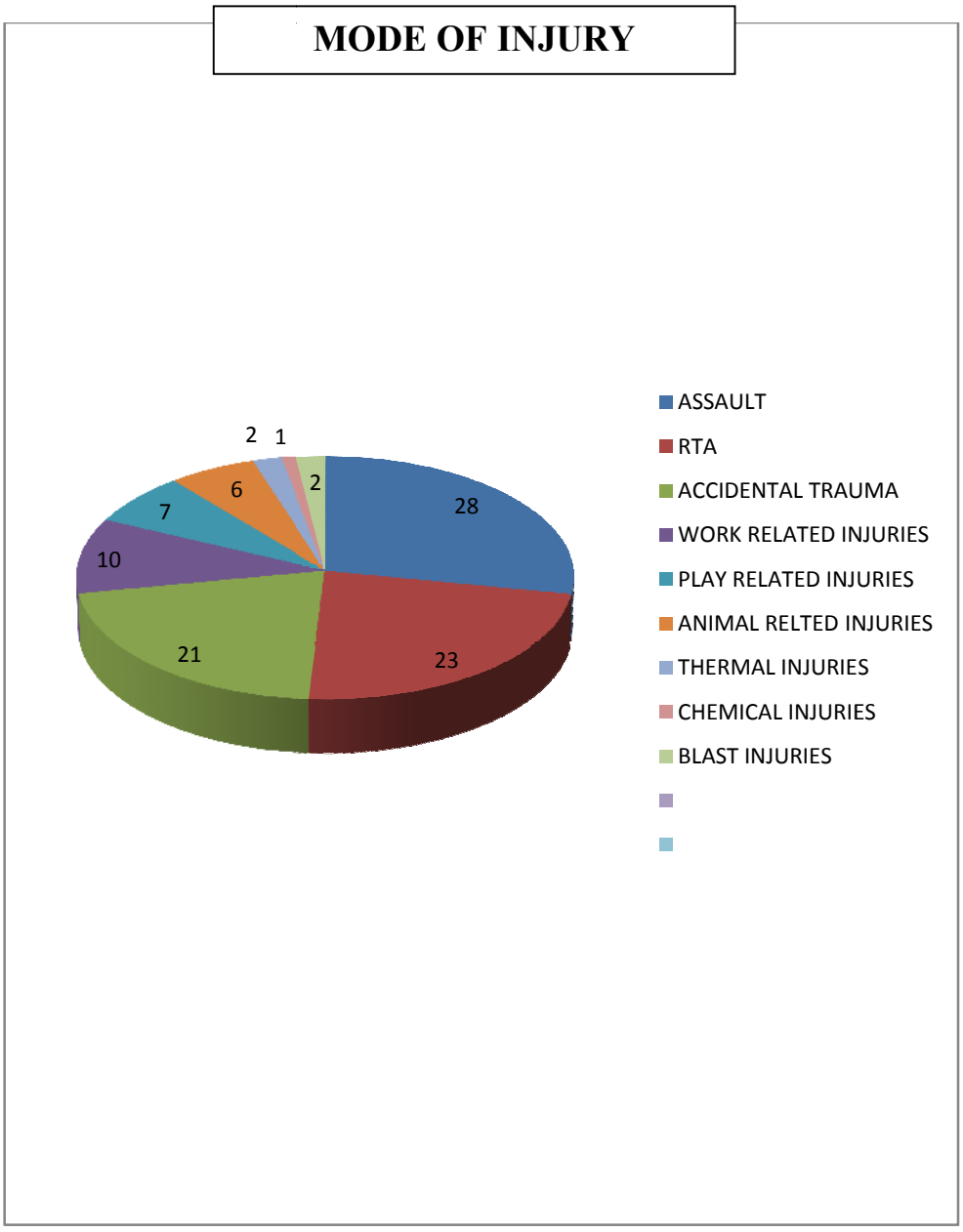
In the age group of 40-60 years , assault was the most common cause of injury.

MODE OF INJURY IN AGE > 60 YEARS:

MODE OF INJURY	NO. OF PATIENTS	PERCENTAGE
ACCIDENTAL INJURIES	3	42.85%
ASSAULT	1	14.28%
ROAD TRAFFIC ACCIDENTS	2	28.57%
WORK PLACE INJURIES	-	-
PLAY RELATED IN JURIES	-	-
ANIMAL RELATED INJURIES	1	14.28%
BLAST INJURIES	-	-
THERMAL INJURIES	-	-
CHEMICAL INJURIES	-	-
TOTAL	7	

In patients more than 60 years, accidental injury was the most common cause.

Out of 100 cases, assault was the most common cause of injury cause in 28 patients.23 cases of injury were due to road traffic accidents. 21 cases were due to accidental trauma (fall injury, accidental injury by sharp objects),10 cases were work related injuries,7 were due to play related injures,6 cases were due to animal attacks,2 cases were due to thermal injuries,2 cases were due to blast injuries,1 case was due to chemical injury.


MODE OF INJURY
28
23
21
10
7
6
2
1
2
ASSAULT
RTA
ACCIDENTAL TRAUMA
WORK RELATED INJURIES
PLAY RELATED INJURIES
ANIMAL RELTED INJURIES
THERMAL INJURIES
CHEMICAL INJURIES
BLAST INJURIES

EYE INJURED:

Left eye was injured in 56 patients. Right eye was injured in 42 patients. 2 patients had injury of eyelids of both eyes. Left eye was involved 1.34 times than right eye.

RIGHT EYE	42
LEFT EYE	56
BOTH EYES	2

EYELID INJURED:

Lower eyelid was involved 1.65 times more than upper lid. Injury to both upper and lower eyelid was seen in 7 patients.

UPPER EYELID	35
LOWER EYELID	58
BOTH UPPER AND LOWER EYELID	7

TIME OF PRESENTATION TO HOSPITAL:

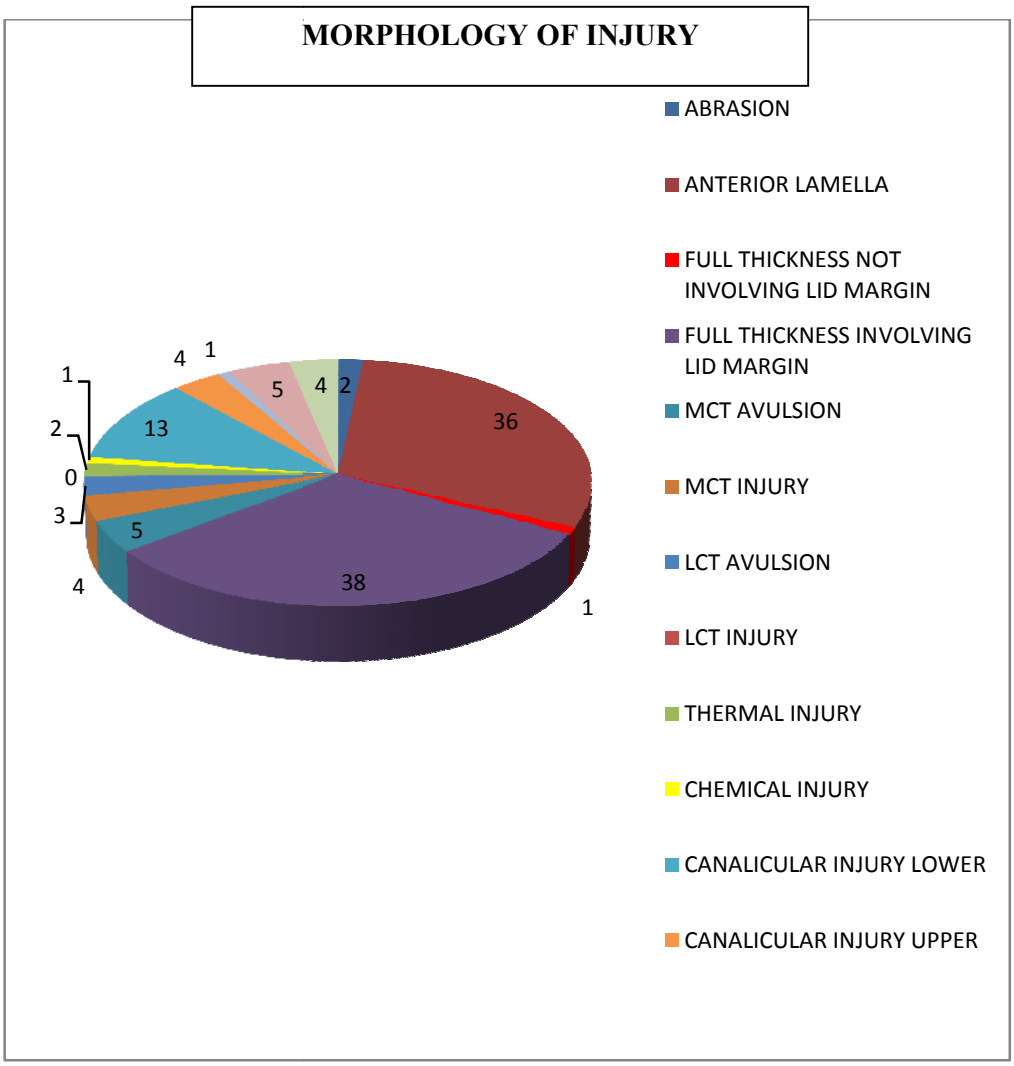
76 patients presented within 24 hours of injury.

TIME OF PRESENTATION TO HOSPITAL	NO. OF PATIENTS
0-6 hours	32
6-24 hours	44
24-72 hours	17
>72 hrs	7

MORPHOLOGY OF INJURY

ABRASIONS	2
SUPERFICIAL SKIN LACERATIONS	5
ANTERIOR LAMELLA NOT INVOLVINGMARGIN	36
FULL THICKNESS NOT INVOLVING MARGIN	1
FULL THICKNESS INVOLVING MARGIN	38
TISSUE LOSS	4
CANTHAL TENDON INJURIES	
MCT INJURY	4
MCT AVULSION	5
LCT AVULSION	3
CANALICULAR INJURY	
UPPER	4
LOWER	13
BOTH CANALICULI	1
THERMAL BURNS FIRST DEGREE BURNS	2
CHEMICAL INJURY THIRD DEGREE BURNS	1

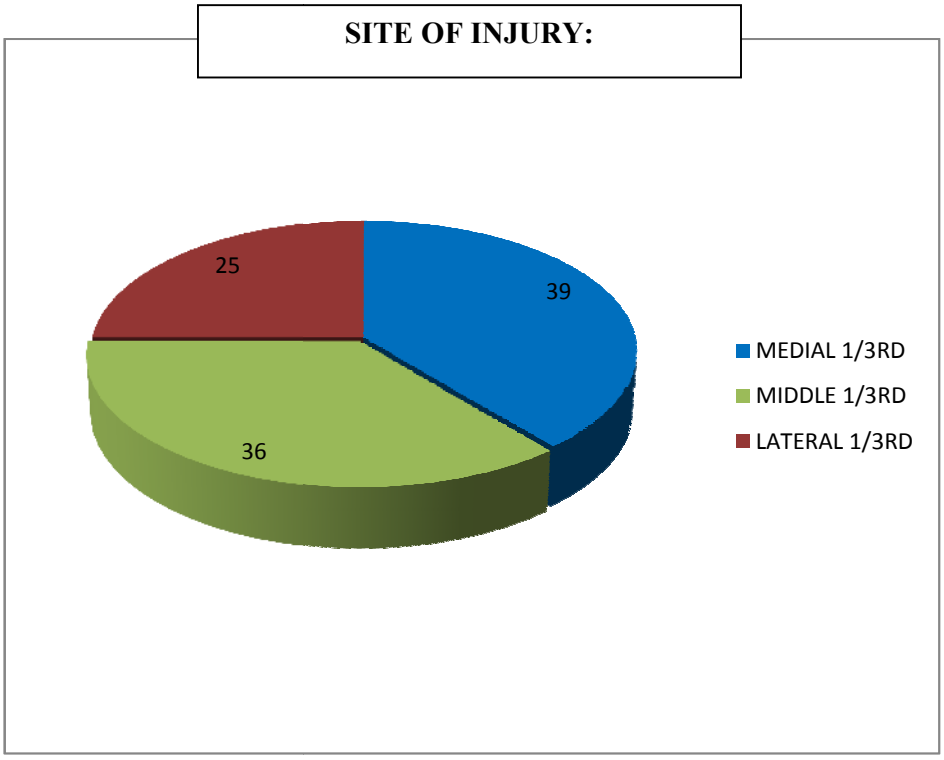
In our study, full thickness injury involving lid margin was the most common lesion, found in 38 patients. Partial thickness wounds not involving margin which was found in 36 patients. Canalicular injury was found in 18 patients, Canthal tendon avulsion was found in 8 patients. Tissue loss was found in 4 patients. First degree thermal injury was found in 2 patients. Third degree burns due to chemical (acid) injury was found in 1 patient


MORPHOLOGY OF INJURY
ABRASION
ANTERIOR LAMELLA
FULL THICKNESS NOT INVOLVING LID MARGIN
FULL THICKNESS INVOLVING LID MARGIN
MCT AVULSION
MCT INJURY
LCT AVULSION
LCT INJURY
THERMAL INJURY
CHEMICAL INJURY
CANALICULAR INJURY LOWER
CANALICULAR INJURY UPPER
2
36
1
38
4
5
3
0
2
1
13
4
1
5
4

SITE OF INJURY:

Medial 1/3rd of eyelids was the site of injury in 39 patients. Medial 1/3rd was involved 1.08 times more than middle 1/3rdand 1.56 times more than lateral 1/3rd.

SITE OF INJURY	NUMBER OF CASES
MEDIAL 1/3rd	39
MIDDLE 1/3rd	36
LATERAL 1/3rd	25



TYPE OF SUTURING:

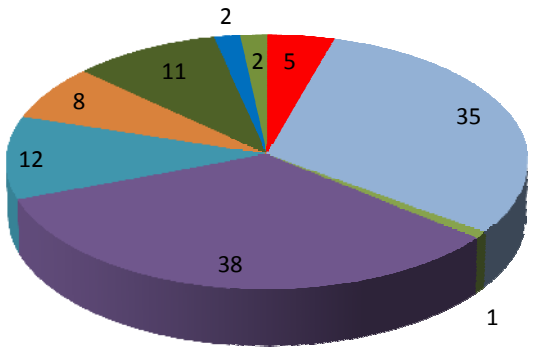
SUTURING DONE	NO. OF CASES
SIMPLE SKIN SUTURING	5
SKIN,ORBICULARIS	35
SKIN,ORBICULARIS,LPS	1
SKIN, ORBICULARIS, TARSUS,WITH THREE SUTURE TECHNIQUE FOR EYELID MARGIN	38
CANTHAL TENDON AVULSION-ANCHORING MEDIAL LATERAL	 5 3
CANTHAL TENDON INJURY-REPAIR MEDIAL	4
ROTATION FLAP UPPER LOWER LID RECONSTRUCTION BY LATERAL CANTHOLYSIS	 1 1 2
CANALICULAR REPAIR WITH INTUBATION WITHOUT INTUBATION	18 8 10

- Superficial skin lacerations were found in 5 patients which were treated by suturing skin.
- Patrial thickness wounds involving anterior lamella found in 36 patients were repaired by suturing with Vicryl to repair muscle and silk suture to approximate skin.
- Full thickness wounds not involving margin was found in one patient. Full thickness wound involving lid margin found in 38 patients, were

repaired by approximating the wound in 3 layers lid margin approximated using three suture technique.

- Lower canalicular injury was found in 13 patients ,upper canalicular injury was found in 4 patients, both upper and lower canaliculi were injured in 1 patient.
- Medial canthal tendon injury was found in 4 patients, avulsion was found in 5 patients. Lateral Canthal tendon avulsion was found in 3 patients.
- Tissue loss was found in 4 patients. In 2 patients tissue loss was less than 1/3rd of horizontal extent of lid. These two cases were managed by direct closure after lateral cantholysis. In 2 patients, tissue loss was more than 1/3rd of horizontal extent, in these patients cheek rotation flap was used to reconstruct the lids.

TYPE OF SUTURING:



- SKIN SUTURING
- SKIN,Orbicularis
- SKIN,ORBICULARIS,LPS
- THREE LAYER APPROXIMATION WITH THREE SUTURE TECHNIQUE
- CANTHAL TENDON REPAIRS
- CANALICULAR REPAIR WITH INTUBATION
- CANALICULAR REPAIR WITHOUT INTUBATION
- LATERAL CANTHOLYSIS
- ROTATION FLAPS

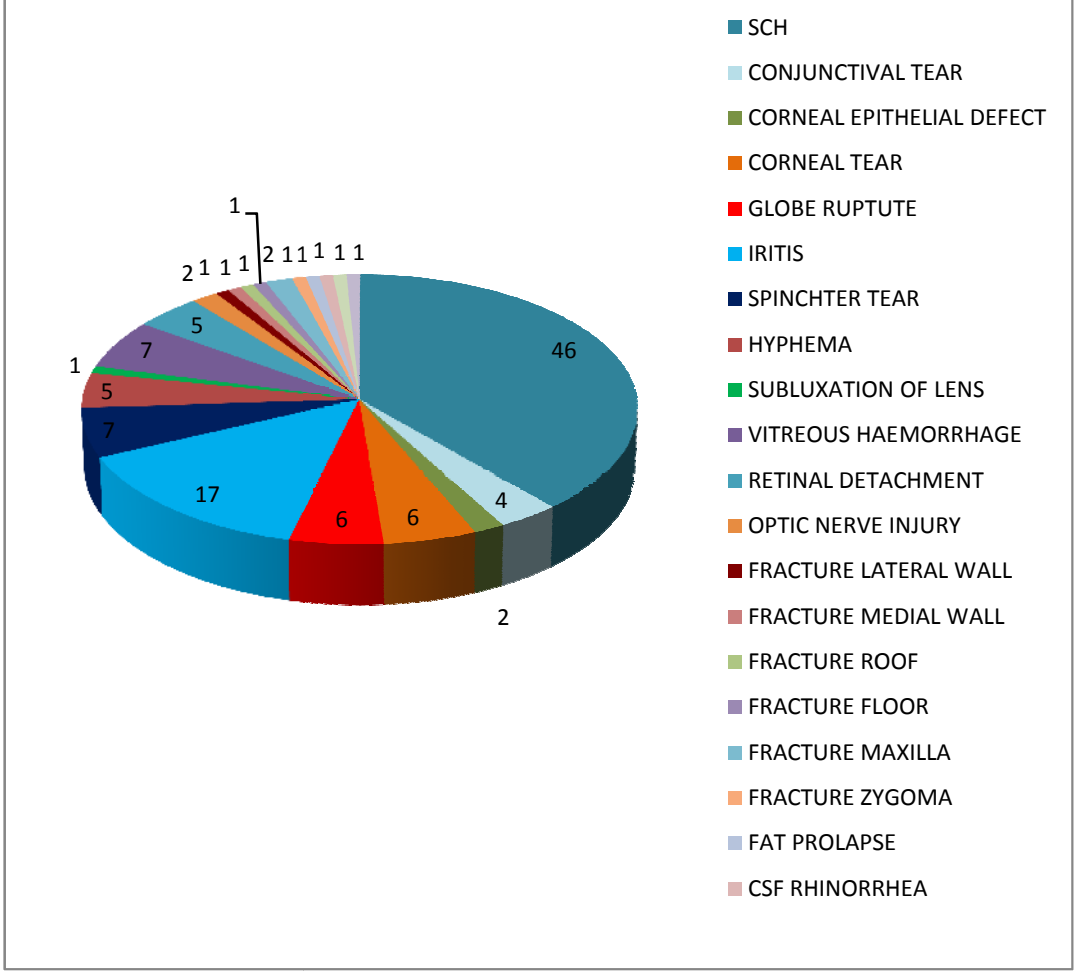
ASSOCIATED OCULAR INJURIES:

SUBCONJUNCTIVAL HAEMORRHAGE	46
CONJUNCTIVAL TEAR	4
CORNEAL EPITHELIAL DEFECT	2
CORNEAL TEAR	6
GLOBE RUPTURE	6
IRISITIS	17
SPINCHTER TEAR	7
HYPHEMA	5
SUBLUXATION OF LENS	1
VITREOUS HAEMORRHAGE	7
RETINAL DETACHMENT	5
OPTIC NERVE INJURY	2
RETROBULBAR HAEMORRHAGE	1
FRACTURE LATERAL WALL	1
FRACTURE MEDIAL WALL	1
FRACTURE ROOF OF ORBIT	1
FRACTURE FLOOR OF ORBIT	1
FRACTURE OF BONES FORMING MAXILLARY ANTRUM	2
FRACTURE OF BONES FORMING ZYCOMATIC ARCH	1
ORBITAL FAT PROLAPSE	1
CSF RHINORRHEA	1

- Sub conjunctival haemorrhage was the most common associated ocular finding in 39 patients with lid injuries.

- Traumatic cataract, Subluxation of lens and retrobulbar haemorrhage were found in one patient each.
- Corneal tear was found in 6 patients. Vitreous haemorrhage was found in 7 patients,retinal detachment was found in 3 patients.
- Prolapse of orbital fat Cerebrospinal fluid rhinnorhea was present in 1 patient (case:64)
- Restriction of all extraocular movements were found in 3 patients. Restriction of elevation was found in 2 patients, depression in 1 patient, adduction in 1 patient and abduction in 2 patients. These movements inproved as ecchymosis and oedema subsided.
- Patient with injury to floor of orbit presented with restriction of movement due to muscle entrapment.
- Injury to lateral wall ,medial wall, roof, floor of orbit were found in 1 patient each,.Injury to roof of orbit was found in patients with injury to upper eyelid. Fracture of zygoma was found in 1 patient, internal fixation of bone was done in oral maxilla facial surgery department. Fracture of maxilla was seen in 2 patients. Patient is being followed up in Otolaryngology department.

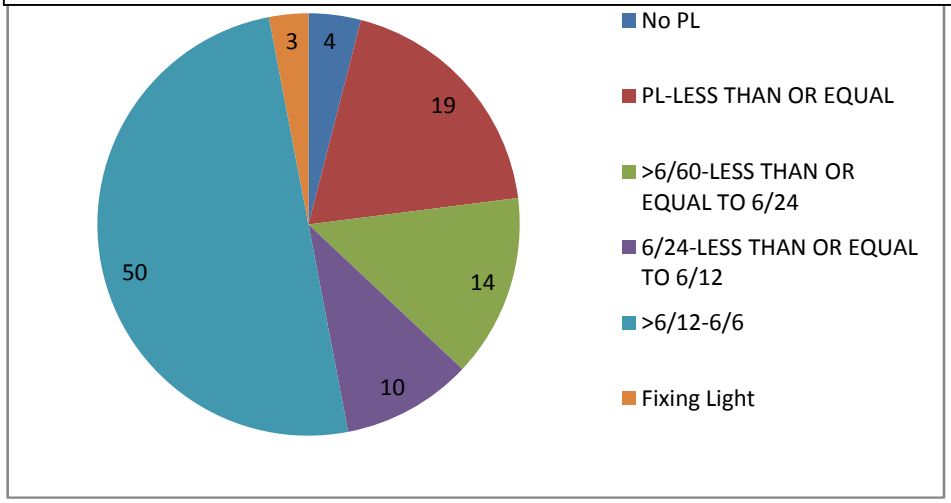
ASSOCIATED OCULAR INJURIES:



VISUAL ACUITY AT TIME OF PRESENTATION TO HOSPITAL:

VISUAL ACUITY	NO. OF PATIENTS
NO PL	4
PL –less than or equal to 6/60	19
>6/60-less than or equal to 6/24	14
>6/24-less than or equal to 6/12	10
>6/12-6/6	50
Fixing and following light	3

VISUAL ACUITY AT TIME OF PRESENTATION TO HOSPITAL:



In our study, 3 cases of globe rupture and 1 case with optic nerve injury presented with absence of perception of light. 19 cases presented with vision less than or equal to 6/60, due to associated ocular injuries. 50 patients had vision better than 6/12.

COMPLICATIONS :

EYELID DEFORMITIES	NUMBER OF CASES
LID NOTCHING	4
CICATRICIAL ECTROPION	2
CICATRICIAL ENTROPION	1
UNSIGHTLY SCAR	2
LID RETRACTION	1
NARROWED PALPEBRAL FISSURE	1
EPIPHORA	5

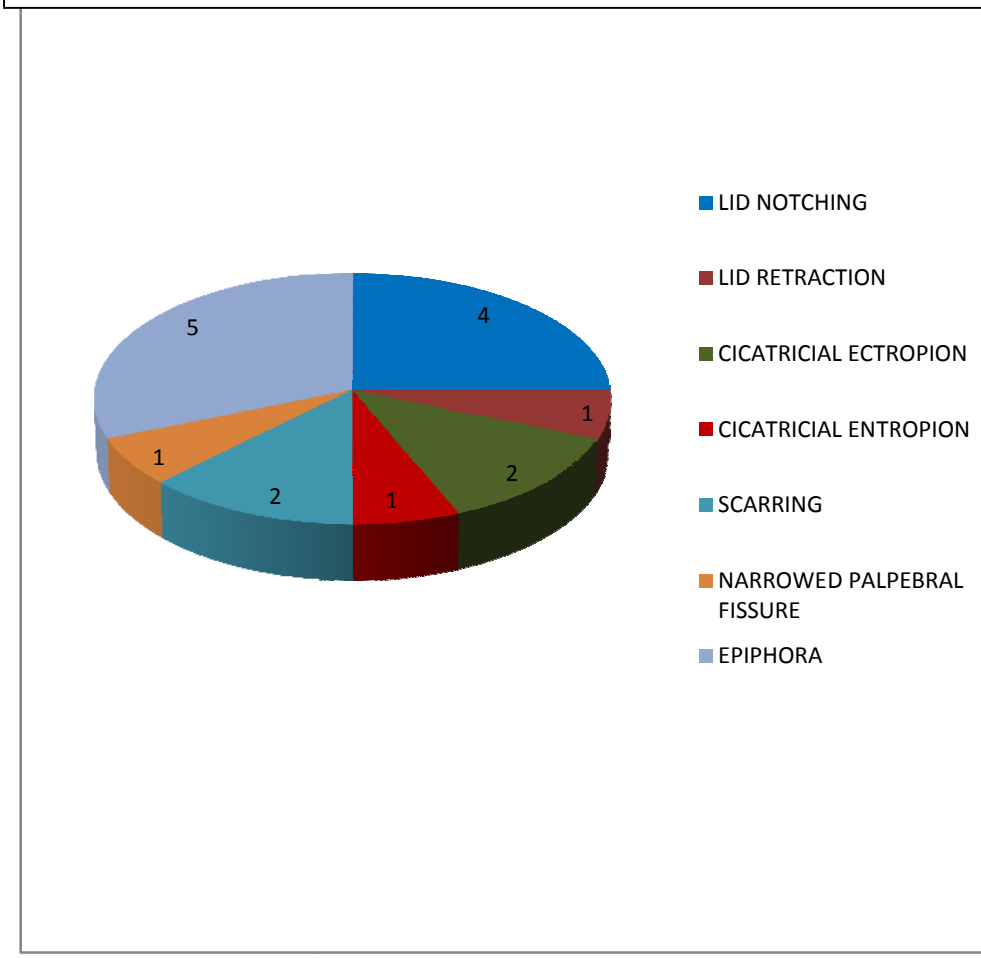
Complication developed in 16% of patients. Lid notching developed in 4 patients, unsightly scars and cicatricial ectropion developed in 2 patients each.Cicatricial entropion, narrowed palpebral fissure and lid retraction developed in 1 patient each. Epiphora developed in 5 patients.

Correction of lid notching was done by pentagonal resection and reconstruction in 2 patients. Cicatricial ectropion in 2 patients were corrected by skin grafting from post auricular region. Cicatricial entropion was corrected by tarsal fracture. Scar release was done in 1 patients. 5 patients with epiphora are being followed up. In one patient with globe rupture, retraction of upper eyelid developed which was treated by tarsorrhaphy as patient had loss of vision in the eye.

SURGERICAL CORRECTIONS DONE FOR DEFORMITIES:

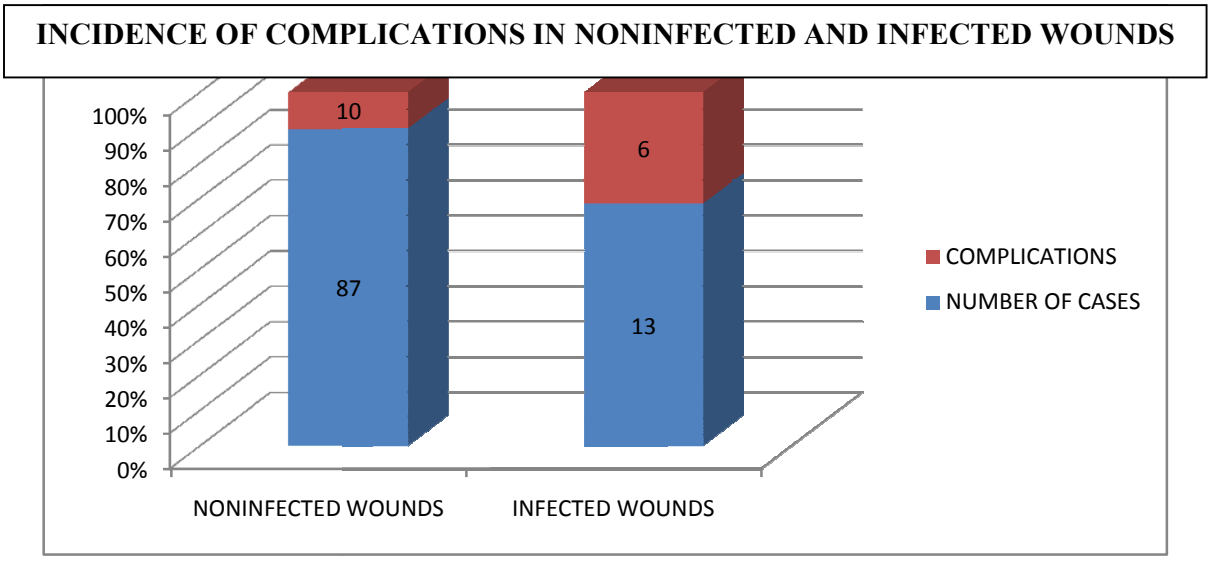
SURGICAL CORRECTION	NO. OF CASES
PENTAGONAL RESECTION AND SUTURING	2
CICATRICIAL ECTROPION CORRECTION BYSKIN GRAFTING	2
CICATRICIAL ENTROPION CORRECTION BY TARSAL FRACTURE	1
TARSORRHAPHY	1
SCAR RELEASE AND SUTURING	1

COMPLICATIONS



COMPARISION OF OUTCOME OF NON INFECTED AND INFECTED WOUNDS:

Out of the 13 patients who presented with infection, structural deformities developed in 5 patients, epiphora developed in 1 patient. Incidence of complications in patients with infected wound was 46.15%. Incidence of complications in patients with non infected wounds was 11.49%.



CHI SQUARE TEST:

	No. of cases	Developed complication	Not developed complication	
Infected cases	13	6(6%)	7(7%)	$\chi 2=10.11$ P=0.006 significant
Non infected cases	87	10(10%)	77(77%)	

P<0.05 is a significant association

In this study, a significant association was found between presence of wound infection and development of complications (structural deformities and epiphora). Eyelid injuries heal well due to high vascularity. Inappropriate management of eyelid injuries lead to infection. This shows the necessity of early repair of eyelid injuries and appropriate antibiotics to prevent wound infection.

DISCUSSION:

GENDER DISTRIBUTION: In our study, 81% were males and 19% were females; male to female ratio was 4.26:1 In study of eyelid injuries- nine year review of management by ST Yiltok,PD et al (2004), male to female ratio was 6.3: 1[8]

AGE DISTRIBUTION: In our study, among male patients, eyelid injuries were most commonly found in age group of 20-40 years, among female patients, eyelid injuries were common in 5-20 age group. In a study of disorders and injuries of eyelid by Lori L Alexander(2008), 20-39 years was commonly affected in males and 50-59 years was commonly affected in females[10].

CAUSE OF INJURY: In our study, upto age of 20 years, accidental injury was the most common cause. In the age group of 20-60 years, assault was the most common cause of injury. In patients more than 60 years, accidental injury was the most common cause..According to Study of eyelid injuries -Nine year review of management by ST Yiltok,PD et al (2004), road traffic accident was the most common cause in 27.3%, assault was the cause in 21.2%, sports related injuries were the cause in 18.4% of cases[8].

TIME OF PRESENTATION:In our study 76% of patients presented within 24 hours.According to study by Shivacharan Lal, Chandra

Vanshi et al (2011), 94.64% patients presented within 24 hours[6].

ANIMAL RELATED INJURIES: In our study animal related injury was found in 6% of patients, 4 cases were due to dog bite,2 cases were due to bull gore injury. Dog bite presented with canalicular laceration in 1 patient. In study about eyelid injuries due to dog bite,by Sarvar A et al (2008), lower canalicular involvement was found in 73%,upper canalicular involvement was found in 16% , both the canaliculi were involved in 11% of patients[12].

CLINICAL PRESENTATION:In our study unilateral involvement was found in 98% patients, bilateral involvement was found in 2% patients According to study by Shivacharan Lal, Chandra Vanshi et al (2011), unilateral involvement was found in 96.4%, involvement of both eyes in 10.71%[6]. In our study, lower eyelid was involved in 58%,upper eyelid in 35%,both upper and lower lids in 6% patients.In epidemiological study of eyelid injuries conducted by Herzum.H.Holle P et al(2001)[2] upper eyelid was involved in 47.2% of patients, lower eyelid in 30.5%,both upper and lower lid in 22.22%.

MORPHOLOGY OF INJURY: In our study, full thickness injury involving lid margin was the most common lesion, found in 38% of patients, followed by partial thickness wounds not involving margin ,found in 36% of patients. According to study by Shivacharan Lal

Chandra Vanshi et al(2011) , full thickness laceration involving eyelid margin was most common lesion found in 35.71%patients,followed by partial thickness lacerations not involving eyelid margin being found in 11.60% of patients[6].

INJURIES TO CANALICULI AND CANTHAL TENDONS: In our study canalicular injury was found in 18% of patients, medial canthal tendon avulsion were found in 5% patients,lateral canthal tendon avulsion was found in 3% patients. According to study by Shivacharan Lal Chandra Vanshi et al(2011), canalicular injury was found in 7.1%, media, medial canthal tendon avulsion was found in 3.75%, lateral canthal tendon avulsion was found in 1.78% of patients[6]. In study of epidemiological aspects of eyelid injuries in Munich, Germany(2001), canalicular injury was found in 16% of patients[11]

INJURIES WITH TISSUE LOSS: In our study tissue loss of less than 1/3rd horizontal extent,was found in 2% of patients, tissue loss of more than 1/3rd but less than ½ of horizontal extent was found in 2% of patients, according to study by Shivacharan Lal Chandra Vanshi et al(2011), tissue loss of 25%-50% was found in 4.46% of patients[6] and tissue loss more than 50% was found in 8.33% of cases[6]

ASSOCIATED OCULAR INJURY: In our study,ocular injuries were found in 50% of patients. According to epidemiological study by

Herzum.H.Holle P, et al(2001), injuries to eyeball were found in 44% of patients[7].

TYPE OF REPAIR: In our direct closure was done in 95% patients. Cheek rotation flaps were done in 2 patients. According to study by Shivacharan Lal, Chandra Vanshi et al (2011)**,** direct closure was done in 85.71% of patients. Lateral fore head flap was done in 1 patient, cutler beard was done in 1 patient, Tenzel's flap was done in 1 patient, Hughes flap was done in 1 patient[6].

In our study, repair of lower canalicular injury was done with canalicular intubation in 8% patients. Lacrimal syringing after 3 months revealed patent lower canaliculus in 7 (87.5%) patients with intubation. Rate of occlusion was 12.5%According to study by Shivacharan Lal Chandra vanshi et al(2011), , canalicular repair was done in 10.71% patients[6]. In study of canalicular lacerations by Milind N Naik et al(2008), canalicular lacerations were found in 36.36% of patients. In that study, canalicular intubation was done in all cases with minimonoka stent, occlusion of canaliculi was found in 10% [9].

DEVELOPMENT OF COMPLICATIONS:

In our study, complications developed in 16%, patients following repair of eyelid trauma, Structural deformities developed in 11 patients. 5 patients developed epiphora. Surgical procedures to correct those deformities were done in 7 patients. According to Shivacharan Lal Chandra vanshi et al(2011), secondary surgical correction was done in 14 patients, ectropion correction and scar revision were done in 3 patients each, , entropion correction was done in 1 patient[6].

In our study high association was found between presence of wound infection and development of eyelid deformities following repair, incidence development of deformities was 46.15% in infected wounds and 11.49% in non infected wounds. In study by Singer AJ et al, unsatisfactory cosmetic outcome was common in infected wounds. In that study, relative risk of 3.2%, (95% CI was1.8-5.6) was found between wound infection and suboptimal cosmetic outcome[15].

.

SUMMARY:

1. Males are affected 4.26 times more than females.
2. In males, 45.67% of injuries occur in age group of 20-40 years. In females, 31.57% of injuries occur in age group of 5-20 years.
3. Left eye was involved 1.34 times more than right eye.
4. Lower eyelid was involved 1.65 times more than upper eyelid.
5. Assault was the most common cause of injury, 28% of cases
6. 76% of patients presented within 24 hours to the hospital.
7. 38% of patients presented with full thickness laceration involving the lid margin.
8. 4% of patients presented with tissue loss..
9. Repair of full thickness wound along with lid margin suturing was done in 38% patients
10. Eyelid reconstruction using flaps was done in 2% patients.
11. Associated ocular manifestations of trauma werefound in 50% patients. Subconjunctival haemorrhage was the most common associated ocular manifestation found in 46% of patients.
12. Globe rupture was found in 6% patients.
13. Complications developed in 16% patients.
14. Surgical procedures done to correct structural deformities were done in 7% patients.

CONCLUSION:

Early and meticulous primary repair showed satisfactory anatomic and functional outcome. Secondary repair if appropriately managed gave good results due to good vascularity of eyelids. But undue delay and inappropriate treatment can lead to infection and fibrosis which will compromise the outcome of repair. Though complicated primary repairs are rare, high association of injuries to eyeball with eyelid injuries stresses the need for management of all cases of eyelid injuries by ophthalmic surgeon.

Early and meticulous repair of eyelid injuries is necessary for restoration of anatomy and function of eyelids.

FULL THICKNESS TEAR INVOLVING MARGIN CASE:68

BEFORE SUTURING

AFTER SUTURING

NON MECHANICAL INJURIES

FIRST DEGREE THERMAL BURNS-CASE:70

CHEMICAL INJURY -CASE:94

LOWERLID AVULSION WITH INFECTION CASE:11

BEFORE TREATMENT

AFTER TREATMENT

MCT INJURY-CASE:78

BEFORE SUTURING

AFTER SUTURING

MCT AVULSION WITH FAT PROLASE-INJURY TO ORBITAL SEPTUMCASE:64

BEFORE SUTURING

AFTER SUTURING

INJURY LOWER LID LACRIMAL CANALICULUS-CASE:99

BEFORE SUTURING

AFTER SUTURING WITH INTUBATION

LOWER LID INJURY WITH TISSUE LOSS WITH INFECTION-CASE:87

PRE OPERATIVE

AFTER SEMICIRCULAR FLAP

POST OPERATIVE:AFTER 25 DAYS

POSTOPERATIVE:AFTER THREE MONTHS

CICATRICIAL ECTROPION -CASE:16

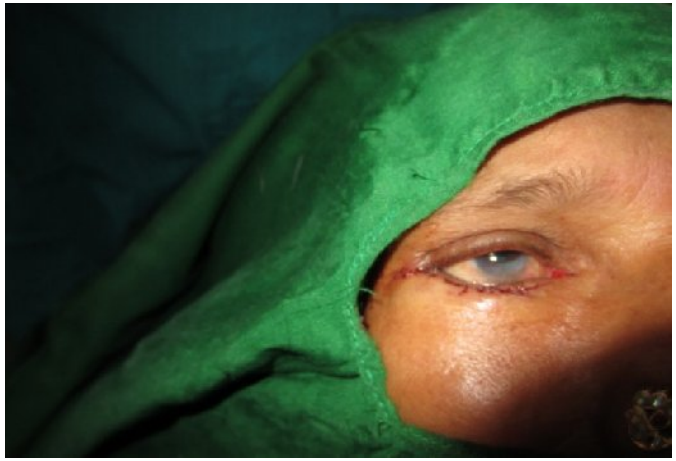
BEFORE SKIN GRAFTING

AFTER SKIN GRAFTING

CICATRICIAL ENTROPION CASE:54

BEFORE TARSAL FRACTURE

AFTER TARSAL FRACTURE



LID NOTCHING-CASE:38

UL NOTCHING

UL NOTCHING

LID NOTCHING AFTER CORRECTION CASE:38

POST OPERATIVE DAY:4

POST OPERATIVE DAY:4

REFERENCES:

1. Snells Anatomy of the Eye, second edition; 93-114.
2. American Academy of Ophthalmology-section 7, Orbit,Eyelidsand Lacrimal System 2009-2010 edition; 191-200
3. Duke Elder's System of Ophthalmology Volume XIV Injuries part I and II
4. Albert's Ophthalmic Surgery-Principles and Treatmeent-Volume II; 1154-1174,1364-1384,1589-1606
5. A manual of Systematic Eyelid surgery-J.R.O.Collin,Third edition;11-13,115-145,147-165
6. Functional and cosmetic outcome following eyelid and adenexal injuries- with 69th AIOC proceedings,2011;1142-1145 –by Dr Shivacharan Lal Chandra Vanshi,Dr Mk Rathore,Dr Eva Tirkey,Dr.P.C.Diuvedi,Dr.S.Agarwal.
7. Study Of Epidemiologiology Of Eyelid Injuries - Herzum. H. Holle P, Hintschick.C 2001 98(11):1079-1082
8. Study of Eyelid Injuries-A Nine Year Review Of Management-ST Yiltok,PD Wade,CDMoyet,Sk Allis, KS Orkar Nigerian Journal Of Ophtha;mology,Volume 3,NO 2(2004).

9. Management of Canalicular Lacerations-Epidemiological acpect and experience with Minimonoka Stent-Millind N Naik,Anagha Kelapure,Suryasatharnath,AJO Feb 2008,Volume 145, NO: 2,375 - 380.
10. A study of disorders and injuries of eyelid by Lori L Alexander,2008.
11. A study of epidemiological aspects of eyelid injuries in Munich,Germany-2001.
12. Canalicular involvement in dogbite related eyelid lacerations-Sarvar A,Kirszort J,Rubin PA,Ophthal Plastic Reconstrucyive Surgery 2008 Jul-Aug;2,24(4):296-8.
13. Pathogenesis Of Canalicular Laceration-Jordan David.R M.D.,Ziai Setarch M.D.,Gilberg Steven,Mawn Louise.
14. Epidemiological Clinical Study-Ophthalmic Plastic and Reconstructive Surgery 1990 6(1):46-53.
15. Determinants of poor outcome after lacerations and surgical incision repair-Department of Emergency Medicine, University Hospital and Medical Centre,State university of Newyork,Brook,11794-7400, Singer AJ, Jhode HC, Hollander JE.

16. Ocular Trauma in relation to road traffic accidents-Dr BNR Subhuti,Arun Kumar Panighari,Sarita Panda,Praveen Subithi,Pranagya Panda.
17. A study of traumatic eyelid injuries by Intrenational Ophthalmology Clinical society-2002.
18. A study of eyelid avulsion and repair with bicannalicular stenting in Nottingham eye hospital- 2010.
19. A study of eyelid injuries as a nine years review-AJOL,2009.
20. A study of eyelid injuries due to dogbites in Pennyslavia-1995.
21. A study of eyelid injuries in Banjara Hills Hospital,Hyderabad 2009.

A PROSPECTIVE STUDY OF EYELID INJURIES

Name: Age: Sex: Occupation:

IP NO: Unit:

Address:

Phone number:

Date of injury:

Date of presentation to hospital:

Date of surgery:

Date of discharge:

Complaints:

Pain	
Defective vision	
Swelling	
Others	

MODE OF INJURY:

Road Traffic accidents	
Assault	
Work place accidents	
Accidental injuries	
Play related injuries	
Injuries caused by animal attacks	
Blast injuries	
Thermal injuries	
Chemical injuries	
Others	

Morphology Of Eyelid Injuries At Time Of Reporting To Hospital-Classification:

Abrasions	
Partial thickness injuries Anterior lamella Posterior lamella	
Full thickness wounds without involving margin	
Full thickness wounds involving margin	
Injury to Canthal tendons Medial canthal tendon Avulsion Injury Lateral canthal tendon Avulsion Injury	

Injuries with tissue loss <1/3 > 1/3-<1/2 >1/2	
Cannalicular Laceration Upper canaliculus Lower canaliculus Both canaliculi	

REGION OF EYELID AFFECTED:

Medial 1/3rd	
Middle 1/3rd	
Lateral 1/3rd	

VISUAL ACUITY AT TIME OF PRESENTION:

VISUAL ACUITY	NUMBER OF PATIENTS
No PL	
PL-</=6/60	
>6/60-</=6/24	
>6/24-</=6/12	
>6/12-6/6	

Bony Defects Associated:

BONE	RE	LE	BOTHEYES
Roof of orbit			
Floor of orbit			
Lateral wall of orbit			
Medial wall of orbit			
Zygomatic bone			
Nasal bone			

ASSOCIATED OCULAR INJURIES:

Sub conjunctival haemoorhage	RE	LE	BOTHEYES
Conjunctival tear Sub conjunctival haemoorhage			

CORNEA:

Corneal epithelial defect			
Corneal tear			

SCLERA:

Globe perforation			

IRIS:

	RE	LE	BOTHEYES
Iritis			
Iridodialysis			

PUPIL:

	RE	LE	BOTHEYES
Spinchter tear			
Traumatic mydriasis			

LENS:

	RE	LE	BOTHEYES
Subluxation			
Dislocation			
Cataractous			

ANTERIOR CHAMBER:

	RE	LE	BOTH EYES
Hyphema			
Hypopyon,viteous			

EOM Restriction:

	RE	LE	BOTHEYES
Elevation			
Depression			
Abduction			
Adduction			

OPTIC NERVE INJURIES:

	RE	LE	BOTHEYES
Compression			

Cut Injury			

OTHER INJURIES:

Retrobulbar haemorrhage			
Proptosis			
Avulsion of globe			

OCULAR EXAMINATION:

Vision		
Tension		
Fundus		
Fields		
Colour vision		

SPECIAL INVESTIGATIONS:

X-ray orbit		
CT-orbit		
B Scan		
Ultrasound biomicroscopy		

SYSTEMIC EXAMINATIONS:

Pulse	
BP	
Pallor/anaemia	
History of DM/HT/IHD/COPD	
RBS in mg/dl	

TREATMENT OF EYELID INJURIES:

	RE	LE	BE
Topical Antibiotics			
Simple skin suturing			
Skin &muscle suturing			
Skin ,muscle& tarsal plate suturing			
Full thickness repair including lid margin suturing			
Canthal tendon repair MCT LCT			
Canalicular repair With intubation Without intubation			

Correction of tissue loss Lateral cantholysis Cheek rotation flap Semicircular flap Skin Grafting			

DURATION BETWEEN INJURY AND PRESENTATION:

Duration between injury and presentation	
<6 hours	
6-24 hours	
24-72hours	
>72 hours	

EYELID ABNORMALITIES DUE TO EYELID INJURIES:

	1 week	1 month	3 months	6 months
Wound infection				
Lid notching				
Ptosis Neurogenic Aponeurotic				
Lid retraction				
Ectropion				
Entropion				
Ankyloblepharon				
Symblepharon				
Trichiasis				
Epiphora				
Scaring				
Others				

SECONDARY SURGICAL CORRECTION:

Indication for secondary surgical correction	
Wound infection	
Lid notching	
Ptosis Neurogenic Aponeurotic	
Lid retraction	
Ectropion	
Entropion	

Ankyloblepharon	
Symblepharon	
Trichiasis	
Epiphora	
Scaring	
Others	

SURGERIES DONE:

Pentagonal excision and suturing(Correction of lid notching)	
Skin grafting	
Everting sutures	
Epilation	
Ptosis correction	
Symblepheron release	
Scar release and Z plasty	
Tarsorrhaphy	
Others	

KEY TO MASTER CHART:

ACC: Accidental Injury

AL: Anterior Lamella of Eyelid

ANCH: Anchoring

AN IN: Animal Related Injury

ASS: Assault

BE; Both Eyes

BL: Both Eyelids

CAN INJ: Canalicular Injury

CFCF: Counting fingers close to face

CICT ECT: Cicatricial Ectropion

CICT ENT: Ctcatricial Entropion

CHE INJ: Chemical Injury

CNT: Conjunctival tear

CED: Corneal Epithelial Defect

COMPL: Complication

CRT: Corneal Tear

CRF: Cheek rotation flap

CRTS: Corneal tear suturing CSII: Cataract surgery with IOL implantation

D: Days

DUR: Duration

EIN: Eye involved

F: Female

FB: Foreign body

FDB: First degree burns

FP: Fat prolapse

FRA: Fracture

FL: Floor of orbit

FTM: Full Thickness Laceration Involving Margin

FTNM: Full Thickness Laceration Not Involving Margin

G: Gender

GLR: Globe Rupture

GLRS: Globr rupture suturing

H: Hours

HM: Hand movements

HY: Hyphema

INT: Intubated

IOFB: Intraocular Foreign Body

LA: Lid Avulsion

LCT: Lateral canthal tendon

LCNT: Lateral canthotomy

LE: Left Eye

LL: Left Lid

LIN: Lid involved

LN: Lid Notching

LR: Lid Retraction

LRC: Lid reconstruction

LRII: Lens removal with IOL implantation

LY: Lateral cantholysis

LW: Lateral wall

M: Male

Max: Maxilla

MCT: Medial Canthal Tendon

MOI: Mode of Injury

MOR: Morphology of injury

MW: Medial wall

NINT: Not Intubated

OCUL SURG: Ocular surgery

ON INJ: Optic Nerve Injury

P: Present

PRS: Pentagonal Resection and Suturing

PL: Perception of Light

PR: Projection of Light

RBH: Retrobulbar Haemorrhage

ROF: Repositioning of fat

RE: Right Eye

RF: Roof of orbit

RD; Retinal Detachment

RTA: Road Traffic Accidents

SURG COR: Surgical corrections

SC: Scar

SCH: Subconjunctival Haemorrhage

SG: Skin Graft

SSL: Superficial skin laceration

ST: Spinchter Tear

SS: Suturing of Skin

SSM: Suturing of Skin and Muscle

SSTM: Suturing of Skin Muscle Tarsal Plate

T ANB: Topical Antibiotics

TDB: Third degree burns

TCT: Traumatic cataract

THER IN: Thermal injuries

TL: Tissue Loss

TOS: Type of suturing

TS: Tarsal Fracture

TST: Triple Suture Technique

UL: Upper lid

VA: Visual Acuity

VH: Vitreous Haemorrhage

WIN: Wound Infection

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
1	Subramani	24	m	4198	RTA	LE	LL	AL	14H	6/12	P												LWZY	SSM			
2	Chandran	25	m	4247	ASS	RE	UL	AL	4H	6/18														SSM			
3	Rahim	33	m	52918	ASS	LE	LL	FTM CAN INJ	5H	6/12	P													SSMT TST INT			
4	Kuttaiappan	37	m	58197	RTA	LE	UL	AL	3H	6/9														SSM			
5	Vinoth	36	m	4702	RTA	LE	LL	LA LCT	4H	6/36 p	P			P	P	P								ANCH			
6	Badrinath	37	m	37902	ASS	LE	UL	AL	28H	6/12														SSM			
7	Manimaran	35	m	32152	ASS	LE	LL	FTM	4H	6/9	P													SSMT TST			
8	Jeyavelu	55	m	432023	ACC	LE	LL	SSL	14H	6/12														SS			
9	Duraisamy	22	m	42321	AN IN	LE	LL	FTM CAN	12H	6/9	P													SSMTT ST INT			
10	Sadagopan	37	m	43202	RTA	LE	BL	AL	7 H	PL PR DEF	P								P	P				SSM			GLRS
11	Rajesh chander	44	m	41854	ACC	LE	LL	MCT LA CAN INJ WIN	60 H	6/18	P	P												ANCH NINT	EPIPH ORA		
12	Vishnu	13	m	8656	PY	LE	UL	AL	14H	6/9														SSM			
13	Krishnan	71	m	4681	RTA	LE	LL	FTM	16H	5/60	P													SSMT, TST	LN		
14	Abinesh	15	m	4692	RTA	LE	BL	AL	14H	6/9														SSM			
15	Ajith Kumar	14	m	5023	ACC	LE	UL	AL	48H	6/9														SSM			
16	Syed Ahmed	16	m	5125	RTA	LE	LL	LCT LA	16H	6/9	P													ANCH	CICECT	SG	

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
17	BalaKumar	16	m	5311	RTA	LE	BL	AL	14H	6/9														SSM			
18	Raja ViKram	15	m	5387	ACC	LE	LL	ABR	16H	6/9														TANB			
19	Vijaya Kumar	18	m	5792	ACC	LE	LL	FTM CAN INJ	4H	CFC F	P		P	P	P	P								SSMT TST INT			CRTS
20	Basid Mohd	18	m	5812	WKI	LE	UL	MCT LA	3H	6/9														ANCH			
21	vimala	23	F	38738	RTA	LE	LL	FTM	14H	6/9														SSMT			
22	Ajith Kumar	4	M	38185	PY	LE	BL	SSL	4H	6/9														SS			
23	Ganesh	24	M	5845	ASS	RE	LL	FTM	19H	6/9p														SSMT TST			
24	Karthik	26	M	5874	RTA	RE	UL	FTNM	4H	6/9														SSMT			
25	Arumugam	26	M	5931	WK	LE	LL	FTM	7H	5/60	P			P	P			SL						SSMT TST			LRII
26	Mano Prasad	44	M	5946	ACC	LE	LL	FTM	17H	NO PL	P						P		P	P				SSMT TST			GLRS
27	Karthikeyan	27	M	5978	RTA	LE	LL	AL	37H	6/6													MAX	SSM			
28	Subblakshmi	29	F	5992	ASS	LE	UL	FTM CAN INJ	15H	5/60	P			IDP		P								SSMT TST NINT			
29	Prasanna	9	M	4664955	PYI	RE	BL	FTM	12H	6/6	P													SSMT TST			
30	Chandra Kumar	28	M	53381	ASS	RE	LL	FTM	16H	6/9p														SSMT TST			
31	Syed Ali	46	M	6102	ASS	RE	UL	FTM CAN INJ	4H	6/60	P			P	P									SSMT TST NINT			

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
32	Meena	39	F	38778	RTA	LE	UL	FTM CAN INJ	32H	6/9	P													SSMT TST NINT			
33	Stanley Joseph	26	M	366055	AN IN	RE	UL	FTM	12H	6/9														SSMT TST NINT			
34	Krishna Kumar	25	M	6341	RTA	LE	LL	FTM CAN INJ	16H	6/36 p	P			P									FLR	SSMT TST NINT	EPIPH ORA		
35	Sathish	24	M	472431	ACC	LE	LL	FTM	14H	6/9	P													SSM			
36	PandiaRaj	31	M	6351	ASS	LE	LL	AL	28H	6/9														SSM			
37	Murugan	41	M	6388	ASS	RE	LL	FTM	36H	PL PR DEF	P		P	P	P	P		TC		P				SSMT TST			CRTS CSII
38	Ganes prab	27	M	6901	ASS	LE	UL	FTM	4H	6/24														SSMT TST			
39	Raja	27	M	6927	RTA	LE	LL	AL	14H	6/9														SSM			
40	Johnson	64	M	6938	ACC	RE	UL	AL	11H	6/9p														SSM			
41	Alagesan	33	M	476832	ASS	LE	UL	AL	32H	6/9														SSM			
42	Karthika	4	F	6987	AN IN	RE	LL	FTM	3H	6/9														SSMT TST			
43	Kondaiyya	47	M	7022	ASS	LE	UL	AL	4H	6/60	P			P	P	P								SSM			
44	Aravindan	49	M	7047	ASS	LE	LL	FTM	16H	6/12	P													SSM TST			
45	Ganapathy	56	M	7094	ACC	LE	LL	AL	14H	6/24														SSM			
46	Elliyah	54	M	7123	ASS	LE	LL	AL	10H	6/24														SSM			
47	Saravanan	12	M	7131	RTA	LE	LL	AL	4H	6/24 p				P									MAX	SSM			
48	RajKumar	34	M	7258	BLAST	RE	UL	TL	10H	No PL	P						PFB		P	P				LCT LY LRC	LR	TSY	GLRS
49	Sivanesan	37	M	7284	RTA	LE	LL	MCT LA WIN	4D	6/9	P	P												ANCH			

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
50	Rajeshwaran	34	M	7298	WKI	LE	BL	FTM CAN INJ	15H	1/60	P		P	P					P					TST NINT	EPIPH ORA		
51	Stella Mary	35	F	52185	RTA	LE	LL	AL	13H	6/9														SSM			
52	Rani	37	F	58195	ACC	RE	UL	FTM	4H	PL PR INT	P						P		P					SSMT TST			GLRS
53	Jayaseelan	38	M	7352	ASS	LE	LL	FTM CAN INJ	14H	6/36 p				P										SSMT TST INT			
54	Lakshmiammal	61	F	7378	AN IN	RE	LL	FTM WIN	4D	6/24														SSMT TST	CICEN	TF	
55	Prajesh	23	M	7433	ASS	LE	LL	AL	14H	6/6														SSM			
56	Balaji	22	M	58188	ASS	BE	UL	RE:AL LE:FTM WIN	39H	6/9														SSMT TST NINT	LE:LN	PRS	
57	Venkatesan	25	M	7484	ACC	LE	LL	FTM CAN INJ	30H	6/9	P													TST NINT	EPIPH ORA		
58	Arumugam	55	M	7531	ASS	LE	UL	LA LCT WIN	4D	6/60	P													ANCH			
59	Ramanujam	54	M	7569	RTA	LE	LL	TL	48H	6/9														LCT LY LRC			
60	Veerammal	62	F	58809	ACC	RE	LL	AL	18H	6/36	P													SSM			
61	Ravi Kumar	26	M	51385	WKI	LE	LL	FTM	5H	6/24														SSMT TST			
62	Vijay	37	M	7591	ASS	RE	LL	FTM	14H	6/9														SSMT TST	CICECT	SG	

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
63	Bala Kondaiyya	58	M	60523	ASS	RE	UL	AL	5H	6/18														SSM			
64	Kannan	54	M	581574	RTA	RE	LL	MCT LA FP	18H	PL PR INT	P	P										P	MW	ANCH ROF	NPF		
65	Prasad	26	M	7644	ASS	RE	UL	FTM	46H	6/12	P													SSMT TST			
66	Ammulu	16	F	5642	ACC	LE	LL	SSL	4H	6/9	P													SS			
67	Joseph	64	M	5213	RTA	LE	UL	TL WIN	6D	6/60	P			P	P									LRC CRF	SC		
68	Syed Ali	14	M	5432	PY	RE	UL	FTM WIN	48H	6/9	P													SSMT TST			
69	Navaneethan	10	M	40691	PY	LE	LL	AL	8H	6/9														SSM			
70	Daniel Kumar	35	M	7265	THERIN	RE	LL	FDB	3H	6/6														TANB			
71	Venkatesh	27	M	7683	WKI	RE	UL	AL	3H	6/6														SSM			
72	Ayesha	12	F	7754	ACC	LE	UL	AL	4H	6/9														SSM			
73	Palaniappan	62	M	7781	ASS	LE	LL	LA MCT CAN INJ	14H	6/60	P			P	P									ANCH INT			
74	Rajesh Kumar	28	M	7731	WKI	RE	LL	FTM	14H	6/9														SSMT TST	LN	PRS	
75	Arun Prakash	16	M	60524	BLAST	LE	UL	MCT INJ	12H	PL PR DEF	P	P					P		P	P				ANCH			
76	Manimaran	14	M	62887	ACC	RE	LL	AL WIN	45H	6/9														SSM			

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
77	Akash	3	M	7810	PYI	RE	UL	AL	14H	FL			P											SSM			CRTS
78	Kasiammal	44	F	62887	RTA	RE	LL	MCT INJ	4H	6/6p	P													ANCH			
79	Dharani	15	F	4064718	PYI	LE	UL	ABR	12H	6/9														TANB			
80	Mohammed Ali	17	M	471324	ASS	RE	LL	FTM CAN INJ	3H	PL PR INT	P	P					P		P					SSMT TST INT			GLRS
81	Kaliyammal	54	F	5431	AN IN	RE	UL	AL WIN	5D	6/36														SSM			
82	SuryaPrakash	27	M	406438	WKI	RE	LL	FTM CAN INJ	4D	6/9														SSM TST NINT			
83	Prasad	26	M	7864	THER IN	RE	UL	FDB	4H	6/6														TANB			
84	Saratha	42	F	7882	WKI	RE	UL	AL	48H	6/9														SSM			
85	Vijay Krishnan	19	M	7893	ASS	BE	LL	AL	14H	RE:6/60 LE:5/60	P			P		P								SSM			
86	Praveen Kumar	12	M	7924	RTA	RE	LL	AL	4H	6/9p														SSM			
87	Shantha	54	F	7961	RTA	LE	LL	TL WIN	4D	6/24	P													LRC CRF	LN		
88	Maheshwaran	19	M	7978	ASS	RE	UL	AL	16H	5/60	P			P	P									SSM			CRTS
89	Devi	14	F	7994	ACC	RE	LL	AL	4H	6/9														SSM			
90	Dayalan	47	M	70691	WKI	RE	UL	AL	8H	6/36														SSM			

S.N	Name	AGE	G	IP NO	MOI	EIN	LIN	MOR	DUR	VA	SCH	CNT	CRT	IRS	ST	HY	GLR	LENS	VH	RD	RB	ONI	FR	TOS	COMP	SUR COR	OCUL SURG
91	Narayanan	54	M	70309	WKI	RE	LL	SSL WIN	54H	6/36														SS			
92	Basha	43	M	8044	ASS	RE	LL	FTM	4H	NO PL	P			P		P				P		P	RF	SSMT TST LCNT			
93	Priyadharshini	11	F	8084	AN IN	RE	LL	AL	14H	6/9	P													SSM			
94	Chandran	57	M	8091	CHE INJ	LE	BL	TDB	4H	NO PL	P						P							TANB	UL SC	SCAR RELEASE	
95	Gokul	2	M	463785	ACC	RE	LL	FTM CAN	2H	FL														SSMT TST INT			
96	THirumaran	71	M	463789	ACC	RE	UL	MCT INJ\ CAN INJ	2H	6/60	P													ANCH NINT			
97	Siva Priya	14	F	8189	ACC	RE	LL	SSL	14H	6/6														SS			
98	Venkatesh pradeep	19	M	464645	ACC	RE	LL	FTM CAN	28H	6/12	P													SSMT TST NINT	EPIPHORA		
99	Nandhini	3	F	467755	ACC	LE	LL	FTM CAN	13	FL														SSMT TST INT			
100	Pradeep kumar	24	M	473709	ASS	RE	UL	AL	4H	6/9p	P													SSM			